

MORTAR CARRIERS

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TAMSE VCTM

Notes: The VCTM (sometimes called the VCTM-TAM or TAM-VCTM) is an Argentine mortar carrier based on the chassis of the VCTP armored personnel carrier. The Argentines have 54 of these vehicles on hand at present, though they do not currently have plans to manufacture more. In this role, the turret is removed, and in its place is a hump-backed rear with a set of large hatches, which are opened when the mortar is to be fired. What is normally the rear cargo area is taken up by the mortar, a turntable built into the floor of the vehicle, a special bipod and sight assembly designed for the vehicle, and ammunition racks. However, the VCTM carries only a limited amount of ammunition and charges internally (like almost all mortar carriers) and during most extended firing missions, the VCTM is fed by crewmembers manning ammunition stacks and charge containers outside the rear doors of the vehicle, who attach the charges to the rounds according to the range required and then pass them by hand to the assistant gunner (the crewmember who actually drops the round down the tube). The VCTM also carries a normal baseplate and bipod for firing the mortar outside of the vehicle if necessary. The VCTM retains the rear-mounted remote-control machinegun of the VCTP. Firing ports and their associated vision blocks are deleted. There is a commander's cupola, but it has no provision for armament, though it does rotate manually and all-around vision blocks. The driver has three vision blocks to his front; the two on the outside are wide-angle vision blocks and the one in the middle gives a normal field of view. The middle block can be removed and replaced by a night vision block.

Like the VCTP, the VCTM is a sort of descendant of the Marder. It therefore shares having decent armor protection, though it is not as good as an actual Marder. The VCTP series, including the VCTM does, however, use a more powerful MTU MB-633 720-horsepower turbocharged diesel. The engine is coupled to a manual transmission, and the VCTP series (including the VCTM) is mechanically simplified as much as possible over the Marder or its TAM descendant. The VCTM is amphibious with a minimum of preparation; a trim vane must be erected (this can be done by the driver from the driver's compartment), and the driver must switch on bilge pumps. However, crews are loath to swim the VCTM, as freeboard is not great, and swimming speed is slow. On the front of the glacis, towards the outside and about halfway up, are a cluster of four smoke grenade launchers on either side. A small, hand-held mortar ballistic computer is included in the price below. Drums on each side of the VCTM carry auxiliary fuel, though they are normally filled only during long movements, and the driver draws from those tanks first. The reason for the simplification is because the VCTP series was to be built in Argentina as much as possible (a few specialized parts are built in Germany and the mortar is built in France), and the Argentines have a lesser manufacturing base. Some 70% of the VCTM components are built in Argentina, and 100% are assembled in Argentina.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$93,995	D, A	400 kg	26 tons	5	9	Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
195/136	45/32/2	640+400	385	Std	T3	HF14 HS6 HR6

Fire Control	Stabilization	Armament	Ammunition
None	None	120mm TDA Mortar, MG-3 (R)	61x120mm, 2500x7.62mm

Steyr 4K 7FA AMC 81

Notes: The mortar carrier version of the 4K 7FA was in development at almost the same time as the basic APC, and both appeared in the late 1970s. While the 4K 7FA APC has been almost totally replaced in Austrian service, the 4K 7FA AMC 81 remains in service. Several other countries who use the 4A 7FA also use its mortar carrier iteration. In form, the 4K 7FA AMC 81 is externally and automotively virtually identical to the 4K 7FA APC, though there are external mountings for a baseplate, bipod, and aiming stakes for when use of the mortar away from the vehicle is warranted. The driver remains on the front left of the vehicle with three vision blocks to his front, the centermost of which can be replaced with an IR vision block. The commander's cupola is also retained, with its two-part hatch that opens to the right and left and can be locked open vertically to provide some protection to the commander. The cupola also has all-around vision blocks, and on the rear are four smoke grenade launchers. The cupola may also be fitted with all-around gun shields which are AV2 and add \$400 to the cost of the vehicle. The 4K 7FA does not, however, have any firing ports or associated vision blocks. The rear deck hatch is modified for the use of the mortar through it, and does not have any pintle mounts around it except in the rear. The front-most seat on the right side is still present, and generally reserved for the mortar squad leader; however, he does not have the rotating periscope of the 4K 7FA APC.

Of course, the most dramatic modifications are inside the vehicle. The rear area carries a specially-mounted 81mm mortar, racks for ammunition for the mortar, and limited seating for the mortar crew and very limited room for just about anything else. The mortar on its mount folds down partially inside the vehicle when the hatches are closed. Even so, it's a tight fit for the crew (the driver has perhaps the most space), and most crew equipment invariably gets tied to the outside of the vehicle. Modern 4K 7FA AMC 81s carry a hand-held mortar fire control computer that allows them to calculate items like gun angle and the amount of charges to put on their shells based on the coordinates given to them by the FDC.

As with the rest of the 4K 7FA series, the 4K 7FA AMC 81 has a 320-horsepower turbocharged diesel engine coupled to a semiautomatic transmission. The 4K 7FA AMC 81 uses special wide tracks for performance on snow and mud, and the normally rubber track pads can be replaced with track pads with steel claws in them for performance on ice and in difficult terrain. The engine compartment has an automatic fire extinguishing system, as does the crew and passenger compartments. As with the rest of the 4K 7FA series, the 4K 7FA AMC 81 has a gyrocompass to aid navigation.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$387,386	D, A	400 kg	14.8 tons	5	10	Passive IR (D)	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
151/106	36/22	360	178	Std	T3	HF8 HS6 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	81mm TDA mortar, MAG (R), M2HB	85x81mm, 100x7.62mm, 600x.50

X-1A Mortar Vehicle

Notes: When the Brazilian Army modified most of their X-1As into X-1A1s and X-1A2s, some were modified into mortar carriers. The turret was removed and the turret ring was fitted with large double hatches to be opened for operation of the mortar. Like most such vehicles, the X-1A Mortar Vehicle carries a baseplate, bipod, and aiming stakes on the side for use if the mortar must be dismounted and used away from the vehicle. A commander's cupola has been added at the front left, with all-around vision blocks and a pintle mount; it is manually-rotated. The driver remains in the front right of the hull, with three vision blocks to the front and one to his right. A small number of these vehicles remain in service, but like the X-1A2 itself, they have mostly replaced with more modern mortar vehicles and light artillery.

The interior is heavily-modified to include a special baseplate built into the floor of the vehicle, a special bipod which allows the mortar to be partially folded so the deck hatches can be folded, and an extension for the sight which allows the gunner to see over the vehicle to use it. There are racks for ammunition which surround the walls of the former turret basket and crew compartment on three sides, as well as some behind the driver. The mortar fires over the rear of the vehicle, as in most mortar vehicles. Crew and operating space is as a premium in the X-1A mortar vehicle, with only cramped fold-up seats for the two crewman who are carried in the rear and almost none for personal gear or even the ammunition for their personal weapons.

Like the X-1A, the chassis of the X-1A mortar vehicle is based on a highly-modified M-3A1 Stuart light tank. This chassis has a Saab-Scania 280-horsepower engine and larger fuel tanks than on the M-3A1, a heavily-sloped glacis plate along with mildly-sloped sides, and a new volute suspension which improves off-road performance and smoothens the ride. The transmission is manual.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$26,754	D, A	400 kg	15 tons	4	10	Headlights	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
142/99	33/23	320	148	Std	T2	HF6 HS5 HR5

Fire Control	Stabilization	Armament	Ammunition
None	None	120mm Mortar, M-2HB (C)	77x120mm, 670x.50

EE-11 Mortar Vehicles

Notes: These are EE-11 Urutu wheeled armored personnel carriers modified to carry mortars instead of standard armament, and suitably modified for that role. Two such vehicles exist: one which is turretless and carries an 81mm mortar firing through rear roof hatches, and one which has a 60mm gun/mortar in a small turret matched to a heavy machinegun. These vehicles are used by most countries using the EE-11 Urutu, especially the version carrying the 81mm mortar.

The EE-11 Mortar Vehicle

This version carries an 81mm mortar in the rear and the associated ammunition and equipment. The base chassis is that of a turretless version of the EE-11, though it is suitably modified. The rear deck of the EE-11 Mortar Vehicle has two large hatches opening right and left to allow use of the mortar; the mortar folds down just enough to allow the hatches to be shut, and is raised before firing. The EE-11 Mortar Vehicle retains the commander's cupola of the standard turretless EE-11, which has hatches that open to the right and left, all-around vision blocks, manual rotation, and a pintle weapons mount. Optionally, the commander's cupola can be fitted with all-around AV2 gun shields.

The rear of the EE-11 Mortar Vehicle is heavily-modified to carry the mortar and ammunition racks, as well as some associated equipment such as simple plotting equipment. As with virtually all such mortar vehicles, the baseplate is built into the floor of the vehicle, and bipod is specially designed to be used in a vehicular role. A hand-held mortar fire control is optional (it is not included in the cost below). The mortar fires over the rear of the vehicle. A baseplate, bipod, and aiming stakes are carried strapped to the outside of the vehicle; the aiming stakes are standard mortar firing equipment when a fire control computer is not used, and the baseplate and bipod are for use if the mortar is fired away from the vehicle. Though the standard EE-11 Mortar Vehicle has no firing ports or vision blocks in the sides or rear of the vehicle, the manufacturer will put one firing port in each side of the vehicle and up to two in the rear if desired by the buyer. There are two seats in the rear, the other two crewmembers are the driver and commander. Since the EE-11 Mortar Vehicle is not the biggest mortar carrier around, the ammunition racks in the vehicle are not large; EE-11 Mortar Vehicles often tow an ammunition trailer or are accompanied by an ammunition-carrying vehicle.

The EE-11 Gun/Mortar Vehicle

This version has a small turret mounting a 60mm gun/mortar and a coaxial heavy machinegun. The mortar is capable of near-vertical elevation, but only slight depression; it can therefore conduct conventional mortar indirect fire, or be fired in direct fire like a small low-power cannon. The standard commander's cupola is deleted in this version; the commander is, instead, in the turret (he has all-around vision blocks, but no weapon mount). The turret is small and the gunner is seated mostly in the hull of the vehicle, and the turret has only one hatch, normally for the commander. The turret is capable of fairly quick traverse and can do a full rotation in as little as 10 seconds. Fire control is basic at best for direct fire (the figures listed below); however, the EE-11

Gun/Mortar Vehicle has perfectly adequate sights for indirect fire which do not require aiming stakes to be set up, and a hand-held mortar fire control is optional. Depending upon the buyer's wishes, the EE-11 Gun/Mortar Vehicle may have up to two firing ports in each side and two in the rear; normally, however, the EE-11 Gun/Mortar Vehicle does not have firing ports or even vision blocks in the sides or rear. Unlike the EE-11 Mortar Vehicle above, the Gun/Mortar Vehicle has no provisions for ground mounting of the mortar (or the machinegun, for that matter) away from the vehicle. Though the rear of the vehicle is primarily filled with ammunition racks, there is some space for equipment, and there are two folding seats for the two crewmembers in the rear, who function as loaders as well as preparing the charges on the mortar shells. The EE-11 Gun/Mortar Vehicle is perfectly capable of conducting normal fire support missions, but is also a capable scout vehicle, and can even be used as a light assault gun vehicle.

Common Features

As with a standard EE-11, the standard EE-11 Mortar Vehicles are powered by a 158-horsepower turbocharged diesel engine with manual transmission (an automatic transmission is optional). In 1988, most Brazilian EE-11 Mortar Vehicles were upgraded to use the same 6V53 212-horsepower turbocharged diesel engine as used on the M-113A2, along with an automatic transmission as standard. In addition, vehicle upgrades were offered with more powerful versions of the 6V53 developing either 230 or 260 horsepower. (Generally, at the same time, the radios and night vision equipment was also upgraded.) The EE-11 Mortar Vehicles have a 4x6 suspension, with the four rear wheels being the drive wheels. The suspension is designed for cross-country travel, and both the wheels and tires are large, with run-flat tires. The EE-11 Mortar Vehicles are amphibious, propelled in the water by waterjets and to a lesser extent by the motion of the wheels. The driver is in the front left and has three wide-angle vision blocks to his front; the center block can be replaced with a night vision block. A removable windscreen can be fitted to protect the driver's face and eyes from dust, dirt and mud when he is driving with his head outside of his hatch; this windscreen is of plastic panels in a canvas frame, and folds away and stows inside the driver's compartment when not in use. There is a door in the rear of the vehicle, which may be opened by either the crew or the driver. A second door is on the left side opposite and slightly to the rear of the commander's cupola. On each front fender is a cluster of three smoke grenade launchers.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
EE-11 Mortar Vehicle (153hp)	\$53,212	D, A	600 kg	14.8 tons	4	10	Passive IR (D)	Enclosed
EE-11 Mortar Vehicle (212hp)	\$46,912	D, A	600 kg	14.8 tons	4	10	Passive IR (D)	Enclosed
EE-11 Mortar Vehicle (230hp)	\$46,982	D, A	600 kg	14.8 tons	4	10	Passive IR (D)	Enclosed
EE-11 Mortar Vehicle (260hp)	\$47,092	D, A	600 kg	14.8 tons	4	10	Passive IR (D)	Enclosed
EE-11 Gun/Mortar Vehicle (153hp)	\$107,406	D, A	540 kg	15.3 tons	5	10	Passive IR (D, G, C), Image Intensification (G)	Enclosed
EE-11 Gun/Mortar Vehicle (212hp)	\$81,626	D, A	540 kg	15.3 tons	5	10	Passive IR (D, G, C), Image Intensification (G)	Enclosed
EE-11 Gun/Mortar Vehicle (230hp)	\$81,696	D, A	540 kg	15.3 tons	5	10	Passive IR (D, G, C), Image Intensification (G)	Enclosed
EE-11 Gun/Mortar Vehicle (260hp)	\$81,806	D, A	540 kg	15.3 tons	5	10	Passive IR (D, G, C), Image Intensification (G)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
EE-11 Mortar Vehicle (153hp)	105/53	29/14/3	380	84	Std	W(3)	HF10 HS4 HR3
EE-11 Mortar Vehicle (212hp)	128/68	36/17/4	380	114	Std	W(3)	HF10 HS4 HR3
EE-11 Mortar Vehicle (260hp)	135/70	37/18/4	380	124	Std	W(3)	HF10 HS4 HR3

Vehicle (230hp) EE-11 Mortar Vehicle (260hp) EE-11 Gun/Mortar	148/76	41/20/4	380	142	Stnd	W(3)	HF10 HS4 HR3
Vehicle (153hp) EE-11 Gun/Mortar	97/49	26/13/3	380	86	Trtd	W(3)	TF4 TS3 TR3 HF10 HS4 HR3
Vehicle (212hp) EE-11 Gun/Mortar	118/60	32/16/3	380	119	Trtd	W(3)	TF4 TS3 TR3 HF10 HS4 HR3
Vehicle (230hp) EE-11 Gun/Mortar	125/63	33/17/3	380	130	Trtd	W(3)	TF4 TS3 TR3 HF10 HS4 HR3
Vehicle (260hp) EE-11 Gun/Mortar	137/69	37/18/4	380	149	Trtd	W(3)	TF4 TS3 TR3 HF10 HS4 HR3

Vehicle	Fire Control	Stabilization	Armament	Ammunition
EE-11 Mortar Vehicle	None	None	81mm Mortar, MAG or M-2HB (C)	36x81mm, 1260x7.62mm or 750x.50
EE-11 Gun/Mortar Vehicle	+1	Basic	Thomson-Brandt 60mm Gun/Mortar, M- 2HB	62x60mm, 1260x.50

EE-11 Gun/Mortar Vehicle

Notes: This is a variant of the EE-11 Urutu with a turret mounting a TDA 60mm gun/mortar. This weapon is capable of conventional indirect fire, or can be direct-fired like a small cannon. The turret is small, light, and inexpensive, yet very capable.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$114,100	D, A	1.2 tons	15.55 tons	5	5	Passive IR	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
179/107	38/23/4	380	96	Trtd	W(3)	TF3 TS2 TR2 HF10 HS4 HR3

Fire Control	Stabilization	Armament	Ammunition
+2	Basic	60mm Gun/Mortar, MAG	65x60mm, 2000x7.62mm

Alvis/BAE FV-432 Mortar Carrier

Notes: This is a version of the standard FV-432 serving as a carrier for an 81mm mortar. The current FV-432 Mortar Carriers in service are based on the Mk 2 version, though of course they were originally based on Mk 1 versions and later the Mk 1/1 upgrades. There is some talk of applying most of the Mk 3 Bulldog improvements, but a final decision by the British MoD has yet to be reached as of the time I write this (late June 2011). Other than the British, the Indians bought six FV-432 Mortar Carriers, and the British Army keeps some of them on NATO training bases in Canada for use when their troops go on training exercises there. Currently, a replacement for the FV-432 Mortar Carrier does not appear on the horizon, and it will undoubtedly soldier on for some time, just like the APC version of the FV-432, and it may persist for a while after even the APC version of the FV-432 leaves service.

The FV-432 Mk 1 and Mk 2 Mortar Carriers, and the FV-432 Mortar Carrier in General

Externally, the FV-432 Mortar Carrier appears virtually identical to the standard FV-432, though the baseplate and bipod for ground-mounting the L-16 mortar and a bag containing aiming stakes strapped to the left side of the vehicle near the rear may tip one off. The driver's compartment is in the same place on the left front deck, with three vision blocks to the front, and the middle vision block removable and replaceable by a night vision block. (like the M-113, the FV-432 driver controls his vehicle largely using laterals for steering and braking.) The commander's cupola is likewise in the same place, behind and slightly to the right of the driver. The cupola usually has a cupola for a light weapon (it's not stressed for the sort of weapon which would require an NHT). Though it is not as common as on FV-432 APCs, the commander's cupola of the FV-432 Mortar Carrier may be surrounded by AV2 gun shields. The FV-432 Mortar Carrier has a cluster of three smoke grenade launchers on each side of the vehicle at the top of the glacis.

The rear area of the FV-432 Mortar Carrier is, of course, heavily modified for its mission. Though there are no troop seats and merely three seats for the remaining members of the crew, the normally-roomy interior of the FV-432, gives the crew a little extra working room when manning the mortar and space for an astounding amount of ammunition for the mortar, as well as a little room for troop equipment. Like most such vehicles, the mortar sits on a special baseplate built into the floor of the vehicle, and a special "bipod" designed specifically for vehicular use. The sight comes with an extension to allow it to see over the top of the vehicle. Unlike most such mortar carriers, the L-16 mortar in the rear has a full 360 degrees of traverse – though this can be useful in a fast-changing tactical situation or if the mortar vehicle finds itself lined up wrong when it reaches a firing position, the optimum position for firing remains having the mortar fire over the rear of the vehicle. The normal two-piece circular hatch on the rear deck is replaced by a longer rectangular two-piece hatch on the FV-432 Mortar carrier; the hatchway in general offers more open area when the hatches are open, giving the crew more room to work with the mortar. The large rear door with a vision block in it remains. The FV-432 also has the signature feature of the FV-430 series – the large external NBC pack on the right side of the vehicle, and the associated collective NBC system for the crew. Starting in the mid-1980s, FV-432 Mortar Carrier crews were more and more often issued hand-held mortar fire control computers, and these are part of the cost of the Mk 2 (and Mk 3) versions in the stats below.

The Mk 1 version of the FV-432 Mortar Carrier uses a Rolls-Royce B-Series 240-horsepower gasoline engine, coupled to a GM TX-200 4A semiautomatic transmission. Though this is not a fully-integrated powerpack, the engine and transmission are mounted on a common sub-frame and can be removed in one piece. As with the FV-432 Mk 1, the FV-432 Mk 1 Mortar Carrier was designed with amphibious capability, but this requires that a large flotation screen be erected, a trim vane extended, and a bilge pump turned on – an operation that could take up to a half an hour with inexperienced troops. Due to the heavier weight of the FV-432 Mortar Carrier, swimming is even more dicey, and less recommended than swimming the FV-432 APC. A minor upgrade, the Mk 1/1 version, primarily dealt with small automotive and electrical problems. The Mk 2 version had a new Rolls-Royce K60 multifuel engine, and a few other mechanical and electrical improvements. The Peak Engineering light turret that was applied to some Mk 2 FV-432 APCs was not applied to any FV-432 Mortar Carriers. The short-lived Mk 2/1 modification, which moved the NBC pack inside the FV-432 APCs walls, was never applied to the FV-432 Mortar Carrier.

The FV-432 Mk 3 Mortar Carrier – a Possible Upgrade

As stated above, it is still a question among the British MoD as to whether any Mk 3 upgrades will be applied to the FV-432 Mortar carrier. The Mk 3 FV-432 upgrade primarily addressed protection and mobility issues, but tactical doctrine calls for mortar carriers to be several kilometers behind/away from the main fight. The Mk 3's integrated power pack, along with some other mechanical and electrical improvements, do make maintenance much easier, and that is a motivation for applying at least that part of the upgrade. And of course, enemy forces, especially irregular groups like insurgents, can appear literally anywhere, so this is a motivation for protection upgrades. The stats below, therefore, reflect the maximum amount of projected Mk 3 upgrades for the FV-432 Mortar Carrier being applied.

The engine used in the upgrade is a 260-horsepower diesel engine, along with a fully automatic transmission. The laterals for vehicle control are gone, replaced by a steering yoke and a standard gas pedal and brake pedal. The FV-432 Mk 3 Mortar Carrier has an air conditioning unit, though it is modular and may be removed if it is deemed unnecessary, such as if a war occurs in cold climates, freeing up some interior space. Other improvements include a beefed-up suspension for the crew and troops seats. The FV-432 Mk 3 Mortar Carrier is generally equipped with a GPS unit as well as an extra long-range radio. The smoke grenade clusters have increased from three to four.

Externally, the upgrade is rather stunning, with appliqué aluminum armor applied to basically every surface of the FV-432,

especially the hull floor; on the glacis and hull sides, this appliqué is armor spaced by stand-off bars. The FV-432 upgrade also includes lugs for ERA on the glacis and hull sides. Ahead of the driver and commander's station is a short, wire-cutting mast to keep low-hanging wires from taking the driver's and/or commander's heads off. The commander's position is equipped with a light weapon, as on other FV-432 Mortar Carriers; however, this weapon is standard. Also standard are the AV2 gun shields for the commander's cupola. The FV-432 Mk 3 Mortar carrier is not slated to receive the RCWS station (any iteration of it). In the lower hull, the British have taken a page out of the Russian T-90s tech manual and installed a mine/IED electrical jammer; when the jammer encounters a magnetic mine or one with an electrical fuze within 10 meters, the jammer will disable the fuze from operating on a roll 14 or better on a d20. Note that the mine must be in a 20-degree radius of the front of the carrier. The jammer device is also not a mine *detector* – if the device does not detonate the mine and the mine does not actually go off, the FV-432 Mortar Carrier's crew will not know that the mine is there.

It should be noted that the Mk 3 Mortar Carrier is not amphibious.

Twilight 2000 Notes: In the Twilight 2000 timeline, the Mk 3 does not exist in any form. FV-432 Mortar Carriers and FDCs that were formerly used for training purposes in Canada were "impounded" for use by the Canadians. The Indians never received any FV-432 Mortar Carriers in the Twilight 2000 timeline.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
FV-432 Mk 1 Mortar Carrier	\$84,298	G, A	630 kg	16.4 tons	5	12	Passive IR (D)	Enclosed
FV-432 Mk 2 Mortar Carrier	\$106,298	D, G, A	630 kg	16.4 tons	5	12	Passive IR (D)	Shielded
FV-432 Mk 3 Mortar Carrier	\$110,641	D, A	580 kg	17.5 tons	5	12	Passive IR (D)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
FV-432 Mk 1 Mortar Carrier	106/73	26/16/4	454	143	Std	T2	HF6 HS4 HR3
FV-432 Mk 2 Mortar Carrier	106/73	26/16/4	454	107	Std	T2	HF6 HS4 HR3
FV-432 Mk 3 Mortar Carrier	103/70	25/15	454	133	Std	T3	HF8Sp HS6Sp HR4*

Vehicle	Fire Control	Stabilization	Armament	Ammunition
FV-432 Mortar Carrier	None	None	81mm L-16 mortar, L-7A2 (C)	160x81mm, 1600x7.62mm

*Hull floor AV is 4.

BAE Simba Mortar Carrier

Notes: This is a Simba Low-Profile APC modified for the mortar-carrying role. The Simba Mortar Carrier was originally designed along with the Simba APC by GKN-Sankey as a private venture, and as with the Simba, had sales only to the Philippine Army and police. They bought only a few of the mortar carrier version, for general fire support; the Philippine Army concentrated on the APC versions. Unlike the normal Low-Profile Simba version, the Simba Mortar Carrier is a military vehicle, and does not have the PA system or flashing lights and siren of the normal Low-Profile APC.

As with most such vehicles, the normal passenger is taken up by a mortar using a special turntable set into the floor of the vehicle, and a specially-designed bipod which allows the mortar to fold enough for the overhead hatches to be closed. The Simba Mortar Carrier also has associated equipment such as an extension for the sight, a baseplate and bipod for operation of the mortar away from the vehicle, and minor plotting equipment. A mortar fire control computer is optional and not included in the price below. Much of the space in the rear is taken up by racks for the copious amount of ammunition carried by the vehicle. Space for the crew is limited, and there is a little more room for equipment; there are two folding seats in the rear near the front for the two crewmembers who ride in the rear.

The Simba Mortar Carrier has two large hatches added to the roof of the vehicle to allow the mortar to fire over the back of the vehicle. The driver is on the front left, with a hatch above him and bullet-resistant windows around him; no provision is made for night vision equipment. Behind the driver on a slightly-raised platform is the commander's cupola, which has all-around vision blocks and manual rotation. It has a pintle mount for a weapon. On the frontal AV2 gun shield, a searchlight is mounted. On the left side of the hull to the rear of the commander's cupola is a large clamshell door; there is another (normal) door in the rear. As with the standard Simba APC, firing ports and vision blocks are an option, though a standard fit for the Simba Mortar Carrier is a vision block in the left-side door, the right side at the same place in the hull, and in the rear door; none of these have firing ports. On the upper front, on each side, is a cluster of four smoke grenade launchers.

The engine is to the driver's right and is a Perkins 210Ti Phaser turbocharged diesel developing 210 horsepower. Transmission is automatic. Frontal armor is substantial, but side and rear armor are none too thick. The off-road suspension is 4x4, but run-flat

and/or puncture-resistant tires are optional.

Twilight 2000: In the Twilight 2000 timeline, the Simba Mortar carriers were often used against crowds of protesters. They normally fired CS rounds into crowds, but sometimes heavier ordinance was used. They were also used in a more normal fire support role. A factory for these vehicles was set up in the Philippines just before the Twilight War, and continued operating and exporting these vehicles for at least 10 years after the Twilight War before being burned by rioters. In Britain, production of these vehicles for home use did not start until the Twilight War, and the Simbas used by Britain were largely employed in an internal security role, mostly against marauders, Scottish separatists, and IRA terrorists.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$60,531	D, A	960 kg	10.3 tons	4	6	WL Searchlight (C)	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
169/85	78/39	296	99	Std	W(3)	HF8 HS3 HR3

Fire Control	Stabilization	Armament	Ammunition
None	None	81mm mortar, MAG or M-60 or M-2HB(C)	77x81mm, 1500x7.62mm or 900x.50

Alvis/BAE Stormer Mortar Carrier

Notes: This is a Stormer FV-4333 modified to carry an 81mm or 120mm mortar. It is similar in concept and design to the US M-106 and M-125 mortar carriers, modified to carry the 81mm L-16 or (formerly) a 120mm mortar of a make I have yet to be able to find out. The British Army in the mid-1990s dropped the heavy mortar from its inventory, leaving only the 81mm mortar vehicle. I have included stats below for this heavy mortar vehicle, however. Though the Stormer series has been exported, the mortar carrier never has.

The driver of the Stormer Mortar Carrier is in the customary place in the top left of the glacis, with one wide-angle vision block to the front, replaceable by a night vision block. The commander's cupola is behind him; being a No 16 cupola, he has all-around vision blocks and can aim and fire his weapon (but not reload) while buttoned up. The vision blocks have no magnification, but the machinegun mount has a dual-channel x1/x10 periscope with an aiming reticule. The squad leader's hatch on the right is there, but not normally used by the mortar squad leader (who is usually the vehicle commander), and is just for general use or observation. The rear deck hatches are enlarged for the mortar; the mortar folds down just enough to allow the hatches to be closed. The Stormer Mortar Carrier, like most such mortar carriers, carries a ground-mount baseplate and bipod, as well as aiming stakes (which have largely been made superfluous by the hand-held mortar fire control computer, not included in the price below). The rear area is largely given over to the mortar and its ammunition and charges; though there are two folding seats for the crewmembers which ride in the rear and there is some space for crew equipment, interior space is at a premium.

The Stormer Mortar Carrier is powered by a 250-horsepower Perkins T6.3544 diesel, positioned to the right of the driver, coupled to an Allison T300 automatic transmission that is known for its ease and agility in shifting gears. The engine and transmission as well as some other automotive components are designed as a single integrated powerpack. The driver steers with a yoke and has a conventional brake and gas pedal. Six aluminum, rubber-tired roadwheels are found on each side, with torsion-bar suspension and with hydropneumatic shock absorbers at the first, second, and sixth set of roadwheels, granting a fairly smooth ride. The Stormer Mortar Carrier is amphibious with preparation (with a floatation screen requiring erection, a trim vane extended, and a bilge pump turned on; time required is 15 minutes). A propeller kit can be retrofitted to the Stormer Mortar Carrier for amphibious operations, doubling the Stormer Mortar Carrier's swimming speed. The tension of the tracks can be set by the driver from his compartment using a hand pump, which connects to a hydraulic ram-type tension adjustor (doing this while the vehicle is in motion is definitely discouraged, as it can easily lead to a thrown track).

One handicap of the 120mm mortar-carrying version was the limited onboard ammunition, meaning it often had to tow an ammunition trailer, be followed by one of more ammunition-carrying vehicles, or overstuff the interior and exterior with crates of ammunition.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
81mm Mortar Carrier	\$70,943	D, A	610 kg	12 tons	4	6	Passive IR (D, C)	Shielded
81mm Mortar Carrier (w/Appliqué)	\$71,515	D, A	600 kg	12.6 tons	4	8	Passive IR (D, C)	Shielded
120mm Mortar Carrier	\$69,332	D, A	600 kg	12.1 tons	4	6	Passive IR (D, C)	Shielded
120mm Mortar Carrier	\$69,904	D, A	590 kg	12.7 tons	4	8	Passive IR (D, C)	Shielded

(w/Appliqué)

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
81mm Mortar Carrier	141/99	35/21/2	405	124	Std	T3	HF8 HS4 HR4
81mm Mortar Carrier (w/Appliqué)	134/94	33/20/2	405	129	Std	T3	HF10 HS6 HR4*
120mm Mortar Carrier	140/98	35/21/2	405	125	Std	T3	HF8 HS4 HR4
120mm Mortar Carrier (w/Appliqué)	134/94	33/20/2	405	129	Std	T3	HF10 HS6 HR4*

Vehicle	Fire Control	Stabilization	Armament	Ammunition
81mm Mortar	+1	None	81mm Mortar, L-7A2 (C)	75x81mm, 3000x7.62mm
120mm Mortar	+1	None	120mm mortar, L-7A2 (C)	30x120mm, 3000x7.62mm

*Belly armor for this variant is 3.

GDLS Bison Mortar Fire Support Vehicle

Notes: This is a Bison armored personnel carrier with a turntable mounting an 81mm mortar in the center of the passenger compartment. As such, the interior is heavily-modified to accomplish its mission; in particular, the former rear passenger area is largely taken up by a turntable and special bipod mounting for the 81mm mortar, ammunition racks, stowage for associated equipment, and a bit of interior room to carry part of the mortar crew and some of their equipment. As the standard Bison is spacious inside, this allows the Bison Mortar FSV to carry a large supply of ammunition for its mortar as well as a standard ammunition complement for its roof-mounted machinegun. The Bison Mortar FSV also carries a standard baseplate and bipod to allow the mortar to be removed from the vehicle, ground-mounted, and fired away from the vehicle if it is necessary. Aiming stakes are also carried for properly aiming the mortar if a mortar fire control computer is not available (though one is included in the cost below).

Like the standard Bison, the Bison Mortar FSV is a variant of the LAV II chassis and therefore a relative of the LAV-25, with the turret removed and the rear area raised by almost the same amount, forming a large rear space. The Bison Mortar FSV's driver and commander occupy their customary spaces, the same as those on the standard Bison, and the chassis and hull are largely the same as that of the standard Bison externally. However, instead of relatively small roof hatches with a large flat space behind them, the Bison Mortar FSV has larger hatches to allow unimpeded operation of the mortar. On early Bison Mortar FSVs, the mortar had to be raised into position partially above the roofline before a fire mission; later Bison Mortar FSVs have even larger roof hatches and a periscopic mortar sight extension, allowing fire missions to be conducted with the crew protected by the vehicle's armor (except from the top). Unusually, the mortar fires primarily over the front of the vehicle on the Bison Mortar FSV, though the turntable has a traverse of up to 15 degrees to each side. The rear ramp with a door in it is retained, as are the large stowage bins on the rear sides of the vehicle. Likewise, the air conditioner is retained, as is the collective NBC system, the amphibious capability, and the cluster of four smoke grenade launchers on each side of the hull near the front.

Power is provided by a Detroit Diesel 6V53T turbocharged diesel developing 275 horsepower, coupled to an automatic transmission and conventional driver's controls. The Bison Mortar FSV is amphibious with a minimum of preparation (about 2 minutes), and propulsion in the water is by a pair of waterjets steered by rudders. Drive is 8x8, with the front four and rear four sets of wheels able to steer independently to tighten steering radius. The tires are run-flat. Construction is largely of steel, with a Kevlar anti-spalling liner. The Bison Mortar FSV can take a version of QinetiQ's LAST appliqué armor kit, which includes additional internal anti-spalling panels. In the front of the hull is a winch with a capacity of 6.8 tons and 100 meters of cable.

Twilight 2000 Notes: In the Twilight 2000 timeline, the US Marines acquired 12 of these vehicles in 1995-1996 to help close perceived gaps in the Marines' mortar support capabilities. The US Army bought three Bison Mortar Fire Support Vehicles as test vehicles in the early 1990s for the 9th Motorized Infantry Division, and they put these into action when hostilities started.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Bison Mortar FSV	\$97,492	D, A	450 kg	13.3 tons	4	9	Passive IR (D)	Enclosed
Bison Mortar FSV (LAST)	\$99,080	D, A	340 kg	14.6 tons	4	11	Passive IR (D)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
Bison Mortar FSV	154/49	36/17/4	300	148	Std	W(6)	HF6 HS4 HR3*
Bison Mortar FSV (LAST)	140/44	33/16/3	300	163	Std	W(6)	HF10Sp HS6Sp HR4**

Vehicle	Fire Control	Stabilization	Armament	Ammunition
Bison Mortar FSV	None	None	81mm mortar, C-6 (C)	90x81mm, 1620x7.62mm

*Hull Floor AV is 3.

**Hull Floor AV is 5; Hull Roof AV is 3.

GDLS LAV-M

Notes: This is a mortar carrier modification of the LAV-25 designed by GDLS Canada specifically for use by the US Marines, and designed to be a companion to the LAV-25. So far, only the US Marines use the LAV-M. The hull of the LAV-25 has been retained, though the roofline has been raised a little bit (about 100mm or so). The turret is removed, and the rear area has large hatches to open and permit operation of the mortar. In most other respects (except the interior), the hull is identical to that of the LAV-25.

The driver is in his customary position on the front right, with three frontal vision blocks, one of which can be removed and replaced by a night vision block. The commander has an adjustable stand with a simple commander's hatch; the commander has

three vision blocks to his front, one to the right side, and one to the rear. The center front vision block has an IR channel. Like most Marine vehicles, the LAV-M did not at first have a machinegun for its commander, but most had them added by the commander's request throughout the Marines.

The rear ramp with a door in it is retained, along with the two rear vision blocks. All firing ports have been deleted. At the rear of the vehicle, above the ramp, is a tent extension of the working area, approximately to double normal size; ammunition is often stored in this tent extension if the LAV-M is going to be operating in an area for an extended period. A cluster of six smoke grenades is mounted on each side of the front hull, as the upper point of the glacis plate.

As a variant of the Piranha, the LAV-M has the wedge-shaped nose and moderately-sloped sides of the basic chassis, and an 8x8 suspension with front and rear sets of wheels with independent steering, giving the LAV-M a surprisingly small turning radius. For standard road use, the LAV-M normally uses only the four rear wheels as drive wheels, switching to 8-wheel drive off road. The LAV-M is amphibious with a minimum of preparation (about 2 minutes), and is propelled in the water by propellers and steered by rudders. Power is provided by the standard LAV II engine, the Detroit Diesel 6V53T 275-horsepower turbocharged diesel. This is coupled to an automatic transmission.

The rear area is largely taken up by the mortar on its special floor-mounted turntable and modified bipod, along with an extension allowing the sight to sight targets outside of the vehicle, and racks for mortar ammunition. Two seats are installed for the two crewmembers that are carried in the rear, and there is room for a small amount of personal gear and other equipment. A standard baseplate and bipod is carried externally, being the primary aligning system; this is being increasingly supplanted by mortar fire control computers (included in the cost below). The rear area is largely taken up by the mortar and the ammunition for it; crew space is actually quite small.

The LAV-M was subjected to a version of the SLEP in the 1990s, becoming The LAV-MA1. The mortar fire control is included (and is included in the cost of the basic LAV-M as well), along with a small computer able to generate fire solutions if no FDC vehicle is present. The chassis has been given a general overhaul under the SLEP program. An air conditioner has been added. Currently, LAV-MA1s are scheduled to receive part of the A2 upgrades, including the LAST kit as standard, fire suppression equipment, and suspension upgrades.

The LAV-M is able to take the LAST kit, though only that able to be fitted to the hull, and even this is adapted to the LAV-M's greater height.

As with the LAV-25, power is provided by the standard LAV II engine, the Detroit Diesel 6V53T 275-horsepower turbocharged diesel. This is coupled to an automatic transmission and the driver has a conventional drive control setup. The driver is located on the front left and has three vision blocks to his front. An 8x8 suspension with front and rear sets of wheels with independent steering, giving the LAV-25 a surprisingly small turning radius. For standard road use, the LAV-25 normally uses only the four rear wheels as drive wheels, switching to 8-wheel drive off road. The LAV-25 is amphibious with a minimum of preparation (about 2 minutes), and is propelled in the water by propellers and steered by rudders.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
LAV-M	\$128,676	D, A	525 kg	14.3 tons	4	9	Passive IR (D)	Enclosed
LAV-M (LAST)	\$131,614	D, A	335 kg	15.8 tons	4	10	Passive IR (D)	Enclosed
LAV-MA1	\$162,943	D, A	515 kg	14.3 tons	4	10	Passive IR (D)	Enclosed
LAV-MA1 (LAST)	\$165,881	D, A	325 kg	15.8 tons	4	11	Passive IR (D)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
LAV-M/MA1	155/78	36/18/5	300	168	Std	W(6)	TF6 TS4 TR4
LAV-M/MA1 (LAST)	139/70	32/15/4	300	177	Std	W(6)	HF10Sp HS6Sp HR4*

Vehicle	Fire Control	Stabilization	Armament	Ammunition
LAV-M/MA1	None	None	81mm M-252 mortar, C-6 (C)	84x81mm, 1620x7.62mm

*Roof armor for this version is 3; Floor armor is 5.

Type 63 Mortar Carrier

Next: Two types of mortar carriers based on the Type 63 APC were built by Norinco; both were produced for export and were not used by the PLA. The full list of operators is not known, but probably includes North Korea, Iran, and possibly Iraq, Thailand, and Myanmar; any Iraqi Type 63 Mortar Carriers have almost certainly all been destroyed, while any Iranian Type 63 Mortar Carriers have likely been superseded by newer designs and are in use only by second- or third-line units. As far as is known, all Type 63 Mortar Carriers have been sold with 82mm mortars or 120mm mortars designed for Russian/Chinese-type ammunition.

Type 63 Mortar Carriers are based on the YW-531C (Type 81) version of the Type 63 APC, with a somewhat stretched hull (though with the same amount of roadwheels); nonetheless, the rear of the vehicle is very cramped for its crew, as it is so stuffed with the mortar and associated equipment, and especially, copious ammunition storage. Like most mortar carrier vehicles, the two Type 63 Mortar Carriers carry aiming stakes and a sight extension for aiming the mortar, and a baseplate and bipod externally to allow the mortar to be removed from the vehicle and ground-mounted if necessary. The vehicle can plot fire via manual methods, using a map, protractor, and aiming circle; however, these instruments on the mortar carrier are considered backups, as an FDC vehicle would normally plot the actual fire coordinates. Both vehicles have hookups for two field telephones, though the field telephones and commo wire are generally carried by the accompanying FDC vehicles or cargo/ammunition carrier vehicles. The two types of Type 63 mortar carrier are the YW-304, which carries an 82mm mortar (and has the capability to carry an 81mm mortar instead compatible with basic Western-type ammunition, as well as some Western-type 81mm mortars), and the YW-381, which carries a 120mm mortar (which may be designed to fire Russian/Chinese-type ammunition or basic Western-type ammunition – the Chinese produce several types of 120mm ammunition compatible with Western-type mortars, as well as several Western-type 120mm mortar analogs). The model of mortar depends upon the buying country's wishes. Forward of the rear section, the Type 63 Mortar Carriers have largely the same front area as the Type 63 APC, with the driver on the front left, who has three vision blocks to the front, the center of which may be replaced with a night vision block. The gunner's position is deleted; the rear deck has a large circular hatch opening right and left, with the mortar firing through this hatch over the rear of the vehicle. Like most mortar carriers, the mortars in these vehicles must be raised up into firing position (which consists of removing some locking pins and raising the mortar into place, then reinserting the locking pins). The commander's position is carried over from the Type 81 version of the Type 63 APC (which means it is on the left behind the driver); however, on the mortar carrier versions, the armament for the commander is normally a heavy machinegun instead of a light weapon, and the commander's position may or may not be surrounded with AV2 gun shields. The observation hatch behind the driver is deleted, as are the firing ports and side vision blocks. The crew enters and exits through the deck hatches, the commander's hatch, or driver's hatch.

Being a variant of the Type 81 version of the Type 63, the Type 63 Mortar Carriers have a German-designed 320-horsepower turbocharged KHD BF8L and a manual transmission. The vehicles are amphibious after the erection of a trim vane and turning on a bilge pump; however, like the WZ-701 and Type 81 ACV, freeboard when swimming shrinks to what some consider dangerous levels. Propulsion in the water is by the motion of its tracks. Note that like Thai Type 63 APCs, Thai Type 63 Mortar Carriers mount M-2HBs instead of Chinese machineguns and mount Western-type mortars.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
YW-304	\$57,037	D, A	470 kg	13.5 tons	4	7	Passive IR (D)	Enclosed
YW-381	\$58,624	D, A	430 kg	13.8 tons	5	7	Passive IR (D)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
YW-304	146/103	36/23/4	450	179	Std	T3	HF6 HS3 HR2
YW-381	151/106	30/25/3	450	184	Std	T3	HF6 HS3 HR2

Vehicle	Fire Control	Stabilization	Armament	Ammunition
YW-304	None	None	81mm or 82mm Mortar, DShK or W-85 (C)	120x81mm or 82mm, 500x12.7mm
YW-381	None	None	120mm mortar (Chinese/Russian or Western), DShK or W-85 (C)	50x120mm (Chinese/Russian or Western), 500x12.7mm

Type 85 Mortar Carrier

Notes: Like the Type 63, the Type 85 APC has two mortar carrier versions; the 81/82mm-carrying version has the designation of YW-382, and the 120mm-carrying version has the designation of YW-383. Unlike the Type 63 Mortar Carriers, the Type 85 Mortar Carriers are used by the PLA as well as having been exported to most of the countries that the Type 85 APC was exported to.

As the Type 85 APC is essentially a stretched, updated Type 63 APC, the Type 85 Mortar Carriers are for the most part the same in layout as the Type 63 Mortar Carriers. As the hulls of the Type 85 Mortar Carriers are longer than the Type 63 Mortar Carriers, the rear area and commander's positions of the Type 85 Mortar Carriers is a little more roomy. (The driver's position is unchanged from that of the Type 85 APC.) The driver is in the right front of the hull on the Type 85 Mortar Carriers, with the engine to his left, with three vision blocks to the front, the center of which can be replaced with a night vision block. The commander is to the rear of the driver and is almost always surrounded by AV2 gun shields; note that like the Type 85 APC, Thai Type 85 Mortar Carriers mount M-2HB machineguns (and have Western-type mortars) The third hatch for a gunner is deleted, as

is the two small hatches on either side of the center deck; all firing ports and associated vision blocks are deleted with the exception of the one in the large rear door. On the rear deck is an oversized, two piece, circular hatch that is used to fire the mortar through and can be used for troops standing in vehicle defense. (Note that like on the Type 63 Mortar Carriers and most other mortar carriers, the mortar must be raised into position to fire and lowered again to close the roof hatches.) The mortar carriers carry over the Type 85 APCs collective NBC system.

The front armor is sharply-sloped, and the side armor is moderately-sloped, providing good armor protection in relation to the thickness of the armor. Type 85 Mortar carriers have an automatic fire detection and suppression system for the crew compartment, passenger compartment, engine compartment, and fuel tanks. On either side of the hull front, about halfway down the glacis and to the sides, are a cluster of four smoke grenade launchers. The engine for the Type 85 Mortar Carriers is German-designed and license-built, a BF8L413F 320-horsepower turbocharged diesel. Both can be equipped with external fuel tanks for long-range operations in addition to its internal fuel; these are mounted at the rear. The Type 85 Mortar Carrier is amphibious with a minimum of preparation – a trim vane must be erected at the front of the vehicle and a bilge pump turned on.

The Type 90 APC was also developed into mortar carrier versions; like the Type 90 APC, it was offered only for export, its primary customer being Iran, though rumors of other countries' use have circulated. Like the Type 90 APC, the Type 90 Mortar Carriers are essentially very-little-improved versions of the Type 89 APC (itself a slightly-improved version of the Type 85). Hull armor is not improved over that of the Type 85 Mortar Carriers. Like the Type 90 APC, the machinegun armament is located inside a small turret, though this turret is moved to the commander's position, and the gunner's position itself deleted. The roof hatch deletions and layout is essentially the same as that of the type 85 Mortar Carriers, with the same firing ports and vision blocks being deleted. The driver's station is essentially the same as that on the type 85 Mortar carriers, though the Type 80 Mortar carriers have automatic instead of manual transmission. The engine of the Type 90 Mortar carriers is the same as on the Type 85 Mortar Carriers, and they are likewise capable of amphibious movement under the same conditions, They have the same smoke generation grenades, provision for external fuel tanks, fire suppression equipment, and collective NBC system of the Type 85 Mortar Carriers; they also carry aiming stakes and equipment to ground-mount their mortars. As the Type 90 Mortar Carriers are somewhat larger than the Type 86 Mortar Carriers, they carry somewhat more ammunition for their mortars, and have more internal room for crew and their equipment than on the Type 85 Mortar Carriers. Type 90 Mortar Carriers are typically equipped with a Mortar Fire Control Computer, and can to a limited extent plot their own fire by using this computer. Though normally the mortar is fired over the rear of the vehicle, the Type 90 mortar carriers have the rare ability to fire through a 360-degree arc. The 81/82mm-carrying version is designated the YW-384, and the 120mm-carrying version the YW-385. Though the Chinese are willing to equip the Type 90 Mortar Carriers with Western-compatible mortars, so far, this does not appear to have been done,

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
YW-382	\$84,407	D, A	710 kg	14.7 tons	4	9	Passive IR (D)	Shielded
YW-383	\$86,756	D, A	700 kg	14.8 tons	5	9	Passive IR (D)	Shielded
YW-384	\$98,173	D, A	950 kg	14.9 tons	4	9	Passive IR (D)	Shielded
YW-385	\$98,687	D, A	925 kg	15.3 tons	5	9	Passive IR (D)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
YW-382	145/101	35/21/4	400+300	173	Std	T4	HF6 HS3 HR2
YW-383	144/100	34/20/4	400+300	174	Std	T4	HF6 HS3 HR2
YW-384	144/101	35/21/4	520+300	178	CiH	T4	TF5 TS4 TS3 HF8 HS3 HR2
YW-385	141/99	33/30/3	520+300	184	CiH	T4	TF5 TS4 TS3 HF8 HS3 HR2

Vehicle	Fire Control	Stabilization	Armament	Ammunition
YW-382	None	None	81mm or 82mm Mortar, DShK or W-85 (C)	120x81mm or 82mm, 1000x12.7mm
YW-383	None	None	120mm Chinese/Russian or Western mortar, DShK or W-85 (C)	50xChinese/Russian or Western 120mm, 1000x12.7mm
YW-384	+1*	None	81mm or 82mm Mortar, W-85	125x81 or 82mm, 1050x12.7mm
YW-385	+1*	None	120mm Chinese/Russian or Western Mortar, W-85	52xChinese/Russian 120mm, 1050x12.7mm

*This Fire Control modifier applies only to the W-85 machinegun in its turret.

Type 05 Mortar-Howitzer

The Type 05 was originally meant to be an export-only system, and was offered up on the international market in 2001, with no takers. This version was based on the original Type 90 Wheeled APC chassis. The Type 05 has since been in service with the PLA since 2008, but is currently used only by the PLA 127th Light Mechanized Infantry Division and the 54th Army Group in the Jinan Military region. These current Type 05s are based on an updated version of the Type 90 Wheeled APC, the Type 92.

However, I will include below the original export version (designated PLL-05) for comparison and the “what-if” factor. The Type 05 is one of those vehicles that blur the line between mortar carrier and self-propelled howitzer.

Type 05 (Type 92 WAPC-Based)

On the Type 92 WAPC chassis is mounted a turret, which has the primary armament of a 120mm mortar-howitzer. One might notice that the turret bears a marked resemblance to that on the Russian 2S23 NONA-SVK. Rumors state that the Chinese had a deal all set for 100 2S23s, but it was cancelled at the last minute for unknown reasons. However, the Chinese got details of the turret system, including its armament and fire control systems. The turret therefore is basically the NONA-SVK turret, and the mortar-howitzer essentially the same as the Russian NONA-S. However, the Chinese version of the NONA-S is capable of firing both 120mm mortar rounds as well as 120mm howitzer rounds designed especially for the Type 05, as well as 120mm RAP mortar rounds also specially-designed for the Type 05. (Standard 120mm mortar rounds cannot be used with the Type 05.) Other details will be given under its entry in Large-Caliber Guns (I will admit that, for the moment, the entry is not there yet; a little time is all I ask for...) Fire control in all cases is computer-assisted: For mortar firing, the mortar is laid by GPS and an integral mortar firing computer which allows the Type 05 itself to plot and aim its own fires and operate independently of an FDC (though in most cases, a FIST will still be needed for indirect fire. For use in indirect fire in howitzer mode, the same GPS system along with a separate fire calculation computer specific to howitzer mode does the same job when the gun is firing howitzer rounds. In direct-fire mode, a third fire control computer is used in connection with a laser rangefinder to help the gunner line up his shots, like any other vehicle conducting direct fire with a large-caliber gun. In mortar or howitzer modes, the gun may be fed by an autoloader that allows the Type 05 to conduct sustained shelling (the duration of this, of course, will be dependent upon ammunition supply -- and whether counterbattery fire finds them.) The Type 05 does not carry the baseplate, or bipod of normal mortar carriers, as the mortar-howitzer is not dismountable from the vehicle. However, as a last-ditch backup for conduct of indirect fire, the Type 05 carries aiming stakes in a bag strapped to the side of the hull and manual fire plotting tools. The mortar-howitzer has a high degree of flexibility, with full turret traverse and fire and gun elevation and depression ranging from +80 degrees to -8 degrees.

Physically, the Type 05 looks like the Type 92 in the hull, with the driver's cab separated from the hull by an airtight and armored bulkhead that not only protects the driver from hits that penetrate most of the hull, but also prevents gasses from the mortar-howitzer or from exterior chemical attack from entering the driver's compartment. The driver has conventional controls as well as an automatic transmission and steering and brakes which are switchable from automatic or manual (and the manual modes can also be used as a backup). The driver has three large windshields to the front and each side, and can access a night vision block set in his overhead hatch. The entire vehicle has heating, air conditioning, and an NBC overpressure system with a collective NBC backup, but the driver and the fighting compartments have their own independent systems for these functions. The turret is basically a squared-off oval mounted in the center of the hull, with the turret having hatches for the commander and loader atop, and the gunner using the loader's hatch. In addition to the 120mm mortar-howitzer, the Type 05 has a coaxial Type 59 machinegun, along with a W-85 heavy machinegun as a commander's weapon. The commander's position is ringed by vision blocks. The Type 05 has four smoke grenade launchers on either side of the turret. Ammunition is carried in both the hull and turret, as are the radios; the radio suite consist of two data-capable long-range radios, one medium-range radio, and three short-range radios, ensuring necessary communications. A ruggedized laptop helps sort out and sift data.

Other than a fighting compartment specific to its mission and the resultant ammunition storage, the Type 05's hull is virtually identical to that of the Type 92 WAPC. This includes an uprated version of the German-designed KHB F8L-413F diesel engine, coupled to an automatic transmission. This gives the Type 05 320 horsepower; though as a result of the higher weight it is not as agile as its Type 93 forebearer, it still does well enough. The tires are run-flat and puncture-resistant, and the driver has controls for central tire-pressure regulation. However, all firing ports and associated vision blocks are deleted on the Type 05. The rear doors remain, as they are quite useful for reloading the Type 05, especially during a long fire mission.

PLL-05 (Original Export Version, Type 90 WAPC-Based)

The PLL-05 is for the most part like the Type 05 but...just a little less so. The turret is the same turret, and the armament is the same; the primary differences are in the hull. The driver's cab is similar to the Type 05, but it has no airtight, armored bulkhead between it and the fighting compartment, and it does not have independent systems for heating, air conditioning, and the NBC overpressure or its collective NBC backup. The driver also does not have the night vision block in his overhead hatch. The turret has only three smoke grenade launchers on each side of the turret. As with the Type 05, the rear doors remain, though all firing ports and associated vision blocks are deleted. Of course, the PLL-05 is equipped with the original KHD F8L-413F turbocharged diesel engine, which develops only 256 horsepower, and is linked to a manual transmission. Most other features remain the same as on the Type 05. Many speculations on why the PLL-05 got no export bites have been made, but most of them center around cost and the fact that the Russians are willing to sell their 2S23 for a smaller (real-world) price.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Type 05	\$629,512	D, A	350 kg	16.1 tons	4	10	Passive IR (D, G), Image Intensification (G), Thermal Imaging (G)	Shielded
PLL-05	\$629,272	D, A	350 kg	16.1 tons	4	10	Passive IR (D,	Shielded

G), Image
Intensification
(G), Thermal
Imaging (G)

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
Type 05	135/68	31/16/3	300	156	Trtd	W(3)	TF6 TS5 TR4 HF6 HS4 HR3
PLL-05	131/66	30/16/3	450	133	Trtd	W(3)	TF6 TS5 TR4 HF6 HS4 HR3

Vehicle	Fire Control	Stabilization	Armament	Ammunition
Type 05	+1/+3	None/Fair*	120mm Type 05 Mortar- Howitzer, Type 59, W-85 (C)	30x120mm Mortar-Type Rounds, 6x120mm Howitzer- Type rounds, 1000x7.62mm, 500x12.7mm
PLL-05	+1/+3	None/Fair*	120mm Type 05 Mortar- Howitzer, Type 59, W-85 (C)	30x120mm Mortar-Type Rounds, 6x120mm Howitzer- Type rounds, 1000x7.62mm, 500x12.7mm

*Fire Control and stabilization are for Mortar and Howitzer Mode (before the slash) and direct-fire mode (after the slash).

ZTS PRAM-S Mortar Carrier

Notes: The Czechs have long been building the BMP-2 under license, calling it the BVP-2. In 1990, ZTS completed a conversion of the BVP-2 into an under-armor mortar carrier, with actual production beginning in 1992. However, with the fall of the Iron Curtain, production of the PRAM-S stopped, after 12 were converted; currently the Czech Republic has six and the Slovaks have six. There has been no recent production of the PRAM-S. However, the PRAM-S is still being marketed internationally, this time by ZTS of Slovakia.

The BMP-2 is heavily-modified for its new role; the turret is removed and the roof is raised by about half a meter. The chassis has been lengthened, and now has seven roadwheels. Mounted on the forward part of the roof is the 120mm mortar, which is breech-loaded from within the vehicle. The mortar has a traverse of 15 degrees right and left and from +40 to +80 (thus direct fire is not possible). When on the move, the mortar is lowered to the minimum elevation and locked into place. Armored shutters then close on either side of the mortar, to be opened again before making the mortar ready to fire. On the roof, to the rear of the commander, is a pintle-mounted weapon, normally manned by the loader; however, ZTS will upon request (if they have any sales) mount different secondary weapons on the PRAM-S, including weapons such as an AT-4 ATGM. In addition to the roof hatches, there is a hatch in the left side with a vision block and a door in the rear for resupply of ammunition; it is not accessible by the crew.

The driver sits in his customary place in the front left hull, with the engine to his right. The driver has three vision blocks to his front, the center of which can be removed and replaced with a night vision block. The commander is to the right of the mortar, with a roof hatch above him, three wide-angle vision blocks to his front, and an IR searchlight which he can swivel from inside the vehicle; his center vision block can display the view of the gunner's night vision gear. The gunner is on the left; he has a roof-mounted day laying system as well as a night vision laying system, and he can also turn the IR searchlight as necessary. However, at night, he is more likely to use a combination of inertial navigation (ZTS will add GPS or GLONASS to current versions offered for sale) and a small plotting computer into which coordinates can be punched to produce accurate fire. This system includes a mapping computer with a map display, which the driver can also access. This computer is also used during day fire. The loader is normally seated to the rear of the mortar, and keeps the autoloader filled and puts any special fuzes or charges on the mortar shells. A common option for the PRAM-S on sale these days is an external thermal imaging camera, which is accessible by the gunner and commander. Another option offered for the PRAM-S is a capability for the secondary weapon to be aimed and fired from under armor, and another is a self-surveying ability.

The ammunition is kept on either side of the vehicle and at the rear (but more towards the center); the mortar is normally fed by an automatic loader. The interior is quite cramped for the crew and their equipment, as ammunition supply is copious. The magazines hold 56 rounds of the ammunition supply and the automatic loading system 21 rounds. Radios include two long-range radios, one of which is data-capable; they are normally operated by the commander. Four smoke grenade launchers are positioned on either side of the front of the top of the hull.

The firing ports and the associated vision blocks of the base BVP-2 chassis are deleted on the PRAM-S. The large roof hatches are also deleted. As stated above, the interior of the PRAM-S is largely taken up with ammunition racks and the mortar itself, and room for the crew and their equipment is rather small. The PRAM-S does not carry the baseplate and bipod that most mortar carriers have, as the mortar is not dismountable; however, aiming stakes are carried strapped to the outside for use if the fire control or mapping computers go down. The PRAM-S's mortar fire control system can compensate for the vehicle (and mortar) being canted up to 12 degrees to the left or right, or forwards by 15 degrees or backwards by 9 degrees; it can also, to an extent, compensate for more than one direction of canting. The PRAM-S has a heater and air conditioner for the crew, and the crew is protected by an NBC overpressure system with a collective NBC backup. The crew and vehicle are further protected by an automatic fire detection and suppression system.

The PRAM-S is powered by a UTD-20/3 supercharged diesel with 300 horsepower. The PRAM-S also has double the normal battery complement, allowing the PRAM-S to operate with the engine turned off for a longer time. While the main fuel tanks remain the same as those of the BVP-2, the rear door configuration is different, and there is only one rear fuel tank, which is not in the large rear door, but offset to the right side. The PRAM-S is amphibious with the same preparation as the BVP-2 (the extension of a frontal trim vane and the switching on of bilge pumps, requiring 5 minutes). However, swimming a PRAM-S is in some ways more dangerous than swimming a BVP-2 – the vehicle's added weight is both a help and hindrance in this respect, as the PRAM-S is more stable in the water, but it is also more sluggish and has a dangerously low amount of freeboard. Like the BVP-2, the PRAM-S has shallow foam-filled side skirts to aid in buoyancy.

Note that for the "Updated" version of the PRAM-S below, I have elected to include all the possible modifications listed above.

Twilight 2000 Notes: In the Twilight 2000 timeline, only 12 of these vehicles were built by the November nuclear strikes, so they are rather rare.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
PRAM-S (Original)	\$219,617	D, A	325 kg	17 tons	4	10	Passive IR (D, G), Image Intensification (G)	Shielded
PRAM-S (Updated)	\$319,617	D, A	325 kg	17 tons	4	10	Passive IR (D, G), Image Intensification	Shielded

(G), Thermal
Imaging (G)

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
PRAM-S	118/83	29/23/3	430	187	Std	T3	HF9 HS5 HR4*

Vehicle	Fire Control	Stabilization	Armament	Ammunition
PRAM-S	None	None	120mm breech-loading mortar, NSV (C)	80x120mm, 500x12.7mm

*Hull floor armor for the PRAM-S is 3, except in the part of the vehicle under the driver and turret, where it is 4.

Patria XA AMOS

Notes: Various referred to in different sources as the XA-203 AMOS and the XA-200 AMOS, "XA AMOS" seems to be the designation of the vehicle in most sources. Though in development, the Finns tested the vehicle with an XA-185 base chassis, the current production vehicle uses an XA-203 chassis. This is topped with the Hagglunds/BAE AMOS (Advanced MOrtar System), which consists of a large but low-profile turret housing a pair of long-barreled (barrel length of 2.4 meters) mortars which can fire in the direct-fire mode of conventional indirect fire mode. Several countries are interested or have already purchased the XA AMOS; the Slovaks have already purchased the XA AMOS, and some other Baltic States and Middle Eastern countries are seriously considering the vehicle. One surprising future customer is the US Marines, and AAI in the US has already gotten a license to domestically-produce the XA AMOS for that purpose (though there is still some discussion going on about what the base chassis might be, the Marines appear to be interested in the complete XA AMOS vehicle). It is rumored that the US Army is interested in the AMOS turret system, but wish to mount it on a Stryker chassis. The Swiss and the Saudis are reportedly trying to decide between the XA AMOS and the CV-90 AMOS. The Estonians will probably be the next country that puts the XA AMOS into service, though some reports have them waiting until the AMV AMOS enters production. The Finnish themselves were originally supposed to have the XA AMOS in service in 2003, but delays meant that LRIP did not start until 2006, and deliveries were not completed until 2010. The turret is essentially the same as mounted on the Swedish CV-90 AMOS vehicle, and rounds are being developed in a joint venture between the Swedish, Finnish, Swiss, and Israelis.

In Finnish service, the XA AMOS is intended to be replaced by the AMV AMOS, though full replacement may take until as long from now as 2025. Some other countries are also waiting until the AMV AMOS is in full production.

The AMOS system's mortars are breech-loaded by an automatic loader and can fire a variety of 120mm mortar rounds, some of which were developed specifically for use with the AMOS (though many of these new rounds can also be used with most NATO-compatible 120mm mortars). The mortar barrels are unusual in that they include fume extractors. The turret can rotate, like any other turret, a full 360 degrees; it can also fire regardless of angle of rotation. The AMOS system also includes comprehensive fire control equipment, including a GPS (inertial navigation in prototype phases) coupled to a full computerized mapping system, along with a computer for automatic laying of the mortars (once the vehicle is halted). The automatic laying computer generated fire coordinates from the GPS and mapping computer along with map coordinates given by higher headquarters, an FDC, or a FIST in a more forward position. Alternately, the laying system can generate fire coordinates if the position of the enemy is known (such as in a direct lay) or using coordinates from a counterbattery radar site or vehicle. The AMOS system also has a fire control computer and sights for direct fire. A machinegun is mounted coaxial to the mortars. Night vision equipment is provided for the driver and gunner; the commander can access the gunner's night vision sights, as well as his sight picture. He can also use his own set of sights to prepare the vehicle to engage the next target. The night vision can also be used in direct fire, and for both direct and indirect fire magnified day sights and magnification for the night sights is provided.

The XA AMOS's rear area is largely taken up by ammunition racks and the automatic loading system; the turret is largely taken up by the mortars and the fire control equipment. This means that the interior is rather cramped for the crew and there is little room for their equipment. The driver is in the front left of the vehicle, with the engine to his rear; the entire cab of the XA-203 appears to be there when viewed from the outside, but the right side of the cab is used for equipment storage and also houses some of the computer equipment. The driver has a large windshield to his front and a smaller one to his side; these are made of bullet-resistant glass and have the same armor value as the sides of the vehicle, and an armored shield with vision slits can be lowered over the front windshield to give it the same AV as the rest of the front of the vehicle.. The driver's overhead hatch has a vision block which can be replaced with a night vision block. The rear roof hatches are deleted (the turret is there instead), and the normal commander's hatch is replaced with one on the roof of the turret; this hatch is ringed with vision blocks. The commander does not have a weapon mount. The gunner also has a hatch, but his vision blocks do not include the right side. Crew consists only of the driver, gunner, and commander; the autoloading system generally allows the gunner to run most firing operations, though the commander can also assist if necessary. Firing ports and the associated vision blocks are deleted. The rear doors are retained, but used largely for loading ammunition. As the mortars are not dismountable, the XA AMOS does not carry a set of baseplates or bipods; however, manual plotting boards, a set of maps, several calculators, and a minicomputer are carried, along with aiming stakes, for use if the fire control computers are damaged or aren't otherwise working. Radio communications consist of two long-range, data-capable radios and a medium-range radio.

The XA AMOS is powered by a Valmet 612 DWIBC turbocharged diesel engine developing 271 horsepower. This is coupled to an automatic transmission with manual backup. As with the XA-203, the XA AMOS has a modular power pack which can be replaced with appropriate equipment and personnel in half an hour. An air conditioning module can be easily fitted. The XA AMOS also has several access panels and hatches to further ease maintenance. The XA AMOS has a 6x6 suspension with run-flat tires. An automatic fire detection and suppression system is provided for the power pack, fuel tanks, turret, ammunition storage, and driver's compartment. The crew is also protected by an NBC overpressure system with a collective NBC backup. On each side of the turret are five smoke grenade launchers.

Twilight 2000 Story: This vehicle does not exist in the Twilight 2000 timeline.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$523,821	D, A	375 kg	26.3 tons	3	12	Passive IR (D, G), Image Intensification (G), Thermal Imaging (G)	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
95/48	22/11	325	197	Trtd	W(4)	TF7 TS4 TR4 HF12 HS6 HR4*

Fire Control**	Stabilization**	Armament	Ammunition
+3	Basic	Twin 120mm AMOS Mortars, PKT	100x120mm, 2000x7.62mm

*Floor armor is 4; roof armor is 3.

**Fire Control and Stabilization modifications apply only to direct fire from the mortars or the coaxial machinegun.

Patria XA-361

Notes: As with the XA AMOS, this vehicle is referred to in various sources by several designations, including XA-360 AMOS and XA AMV AMOS. I have used what seems to be the most common designation here. Using the same base concept as the XA AMOS, the AMV AMOS is an XA-360 AMOS chassis topped with the Hagglunds/BAE AMOS (Advanced MOrtar System) turret, with its twin 120mm long-barreled breechloading mortars. Though orders for the XA-361 were placed by Finland as early as 2003, delays in the AMV program meant that deliveries under LRIP did not begin until 2008, and full-scale production has only just begun late in 2010. Other countries who have ordered the XA-361 or a variant include Slovenia (who ordered a single-barreled variant in the same turret known as the NEMO system), South Africa, Croatia (who also ordered the NEMO variant), and Macedonia (likewise). These customers have either not received their XA-361s or variants yet or have received only a few as of late November 2011. Possible future customers include the UAE and Sweden (who designed the AMOS turret and already use it on a CV-90 chassis). The XA-361 is also being tested by the US Marines alongside the XA AMOS for a possible future role in the US Marines; one of them will probably be chosen, with production of the chosen vehicle under license by Lockheed Martin in the US and (according to current plans) first vehicle delivery in 2015.

The NEMO variant will be covered later, when I have more information.

The XA-361 uses the same AMOS turret as the XA AMOS, and readers can refer to the XA AMOS above for most of the details on the turret, mortar autoloading system, and ancillary equipment such as radios, computers, and backup manual equipment. The night vision suite is improved somewhat, especially in the case of the commander, who has his own night vision devices. The primary improvement of having the AMOS turret on an AMV chassis is to take advantage of the greater protection, engine power, and abilities of the AMV. The base chassis is modified somewhat in the XA-361: the roof hatches are deleted, as is the RWS. The driver remains in the same place as in the XA-360, in the front left with three wide-angle vision blocks to his front (and to an extent, they also partially give him vision to the left side. The driver's hatch has a port into which a night vision block can be inserted. Instead of the commander being to his right, the former commander's place is used for equipment storage and some ammunition storage. As with the XA AMOS, the commander and gunner are in the turret. The crew is protected by an NBC overpressure system with a collective NBC backup, and a fire detection and suppression system for the power pack, driver's compartment, turret and mortars, ammunition storage, and the fuel tanks. On each side of the turret are five smoke grenade launchers. The ammunition is loaded through the rear door, which also has a vision block; in addition, a camera in the rear allows the commander to monitor ammunition loading and replenishment using an LCD screen mounted at his station.

As with the XA-360, the XA-361 is powered by a Scania DI-12 543-horsepower turbocharged diesel, coupled to an automatic transmission. The driver has conventional controls. The suspension is 8x8, switchable to 8x4 for road use (with the rear set of wheels being the drive wheels in this case). The rear four wheels steer independently from the front four wheels to tighten the turning radius. As with the XA-360, the XA-361's hull can take MEXAS appliqué armor as well as be fitted with lugs for ERA (though no country has yet ordered MEXAS kits for the XA-361, and it is not covered below). There is no MEXAS kit for the turret, though it too can be equipped with ERA on the turret sides, turret rear, and the front third of the turret roof (there is not enough roof on the turret front to mount ERA). Unlike the XA AMOS, the XA-361's commander's station is equipped with a pintle mount, with the weapon mounted depending upon the customer.

Twilight 2000 Notes: The XA-361 does not exist in the Twilight 2000 timeline.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
XA-361	\$547,599	D, A	550 kg	25.6 tons	3	20	Passive IR (D, G), Image Intensification (G,C), Thermal Imaging (G,C)	Shielded
XA-361 w/Appliqué	\$551,127	D, A	425 kg	26.1 tons	3	20	Passive IR (D, G), Image Intensification (G,C), Thermal Imaging (G,C)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
XA-361	155/78	36/18/4	810	376	Trtd	W(8)	TF7 TS4 TR4 HF15Cp HS8Cp HR6Sp*
XA-361 w/Appliqué	152/77	35/18/4	810	384	Trtd	W(8)	TF7 TS4 TR4 HF19Cp HS10Cp HR8Sp**

Vehicle	Fire Control***	Stabilization***	Armament	Ammunition
XA-361	+3	Basic	Twin 120mm AMOS Mortars, PKT or MAG, NSVT, WKM-B, or M-2HB (C)	100x120mm, 2000x7.62mm, 500x12.7mm or .50

*Roof armor for this version is 5Sp; Floor armor is 8Sp.

**Roof armor for this version is 5Sp; Floor armor is 10Sp.

***Fire Control and Stabilization modifications apply only to direct fire from the mortars or the coaxial machinegun.

GIAT AMX VTT/PM

Notes: Like many countries in the 1960s and 1970s, the French produced a version of one of their standard APCs, the AMX-VCI, for use as a mortar carrier. The AMX VTT/PM entered service shortly after the AMX-VCI in 1968, and was produced in four variants – one with an 81mm mortar, one with a 120mm mortar, with each being initially equipped with gasoline engines and later retrofitted with diesel engines (and other improvements). The broad vehicle designation was the AMX VTT/PM, but the exact designation for the 81mm mortar carrier version was the AMX VCPM de 81, and for the 120mm mortar carrier version, the AMX VCPM de 120. Though 10 countries used the AMX VCI APC or variants of it, only France employed the AMX VTT/PM, and a good number of these vehicles still serve in the French Army, despite being a bit long in the tooth.

The AMX VTT/PM is largely built the same as the AMX VCI APC, with a relatively long chassis, a steeply-sloped glacis with a flat front deck for the driver and engine, and a pulpit-type position behind the driver, in the case of the AMX VTT/PM being manned by the commander instead of a dedicated gunner. The driver has three vision blocks to the front and the middle block can be removed and replaced by a night vision block. The glacis has a splashboard to help protect the driver when fording deep water or from mud, and like many APCs of the time, mounts a spare set of three treads and a roadwheel. The commander has a pintle mount for a medium or heavy machinegun (or other weapon which can fit on the same mount); his position is actually a manually-rotating cupola with all-around vision blocks. The former commander's position remains to the right and rear of the gunner, along with the overhead hatch and vision blocks to the front and right, but is normally occupied by one of the mortar crew. The AMX VCI's slide-open firing ports have been welded shut on the AMX VTT/PM. The AMX VTT/PM has the same dual long overhead hatches in the fighting compartment; unusually, the mortar fires through right-hand hatch, and the mortar fires *forward* over the vehicle instead of over the rear like almost all such mortar carriers. The mortar, however, has limited traverse – 15 degrees to the right and 30 to the left. Larger deflection changes require quick pivot steering by the driver. Early AMX VTT/PMs made the crew rely on their protective masks and chemical protective suits in a chemical warfare environment, but in 1987, they were fitted with a collective NBC system (of course, if the hatches are open, like when the mortar is being fired, chemical protective suits must still be used, and having their masks plugged into a collective NBC system while the crew is rapidly moving about to use the mortar could be problematic).

The original engine of the AMX VTT/PM was a SOFAM 8Gxb 250-horsepower gasoline engine, with a manual transmission. In the 1980s, this was replaced by 280-horsepower Baudouin 6F11SRV turbocharged engine and a semiautomatic transmission. (These diesel-powered versions are sometimes referred to as AMX VTT/PM 1987s.) At about the same time, radios were updated and the driver's night vision block was also updated. The suspension is unusual in that it the line of the tracks is not level; it is noticeably lower at the rear of the vehicle. It is based on conventional torsion bars with shock absorbers at the front and rear of the five roadwheels. Early examples have four return rollers, but later production reduced this to three return rollers. Most tracks for the AMX VTT/PM are steel, but rubber track pads can be retrofitted. The AMX VTT/PM is not amphibious, though fording of up to 1 meter is possible.

The two versions of the AMX VTT/PM are almost identical in weight (negligible for game purposes) and with the mortar down, are externally identical except for the baseplates and bipods carried externally to allow ground-mounting of the mortar if necessary. It is not included here, but in the mid- to late-1990s hand-held mortar fire control computers were issued to the crews of these vehicles, and add-on GPS units were added. The AMX VCPM de 81 carries 128 81mm mortar shells with a full load, but only 88 of these can be more modern mortar shells, WP shells, or illumination shells, which are generally longer than older mortar shells. A further 40 short mortar shells (primarily smoke and HE rounds) can also be carried in addition to those 88 rounds.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
AMX VCPM de 81	\$86,522	G, A	450 kg	16 tons	6	11	Passive IR	Enclosed
AMX VCPM de 81 1987	\$86,947	D, A	450 kg	16 tons	6	11	Passive IR	Enclosed
AMX VCPM de 120	\$81,241	G, A	450 kg	16 tons	6	11	Passive IR	Enclosed
AMX VCPM de 120 1987	\$81,666	D, A	450 kg	16 tons	6	11	Passive IR	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
AMX VCPM de 81/120	111/78	24/18	410	149	Std	T3	HF8 HS4 HR4
AMX VCPM de 81/120 1987	121/85	26/20	410	158	Std	T3	HF8 HS4 HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
AMX VCPM de 81	None	None	81mm Mortar, M-2HB (C)	128x81mm*, 2000x.50
AMX VCPM de 120	None	None	120mm Mortar, M-2HB (C)	60x120mm, 2000x.50

*See Notes above for special rules about 81mm ammunition carriage.

LOHR 120mm SP Mortar System

Notes: Despite the fancy name, this is little more than a 120mm rifled mortar mounted in the back of the High-Mobility version of the Renault TRM 2000 truck, with racks added for the ammunition and the cab expanded to carry the mortar crew and a couple of extra ammunition handlers (to allow the mortar to be fed from ammunition on the ground around the truck or in an accompanying vehicle). Despite being on the market since 1990, and being demonstrated to various countries, no sales have been generated by this system; nonetheless, it is still offered for sale, and LOHR is still ready to start up production should the need arise. (I have not been able to discover if such production would require Renault to manufacture new TRM 2000 trucks, as Renault stopped making them in 2002, or LOHR would license-produce the trucks, or LOHR would simply modify existing TRM 2000s.)

The mortar is mounted on a conventional bipod and baseplate which are attached to the heavily-modified truck bed using quick-release/attach clamps and fittings. The mount is a standard towed-mortar mount, and the wheels remain attached to the mount and the tow bar used to help secure the mortar in the vehicle, also using quick-release/attach fittings. Ammunition racks are mounted at the front of the truck bed and down one-quarter of each side. Before firing, a large spade is lowered at the rear to help stabilize the vehicle as a firing platform; in addition, the suspension is greatly beefed-up, with special extra-heavy-duty shock absorbers, also to take up the shock of firing. While traveling, the mortar is lowered almost flat and locked down, with the mortar sight being removed and stored in a compartment in the ammunition racks; tarps are also carried to protect the mortar and ammunition during movement in inclement weather. 30 seconds are required to bring the mortar into firing position and 20 seconds are required to stow the mortar for movement. The mortar fires forward over the vehicle, with a limited amount of movement being allowed by the mountings to allow large deflection changes. The truck bed is essentially removed, replaced by small platforms for the crew to fire the mortar. The primary advantage of the LOHR 120mm SP Mortar System is that it is more mobile and quicker to bring into action than a towed mortar system, and it can be easily carried by aircraft and helicopters; the system offers little or nothing in the way of protection. The vehicle can also be air-dropped or delivered via LAPES.

The LOHR 120mm retains most of the features of its Renault TRM 2000 chassis, except for the special suspension and larger cab and modified rear. The vehicle is powered by a Renault Type 720S supercharged diesel developing 115 horsepower; at the buyer's option, this may be coupled to an automatic or manual transmission and the vehicle can be supplied with right-side or left-side driver positions. The suspension is 4x4 and the vehicle has run-flat tires. Opposite the driver's side of the cab, the commander's position has a roof hatch with a pintle mount for a light or medium weapon (it is not stressed for heavier weapons such as heavy machineguns or automatic grenade launchers); the pintle is attached to a mount which manually rotates. Since the system uses the High-Mobility version of the TRM 2000 as a base, the ground clearance of the truck is relatively high at 0.425 meters, and the enhanced suspension gives the system good off-road performance and a good ride even over rough terrain. In addition to the hydraulically-operated spade at the rear, the truck has a tow hook at the rear allowing it to tow a trailer with a load of 2 tons. The crew enters the cab through two doors on either side. At the front of the vehicle is winch with a capacity of 2.5 tons.

Twilight 2000 Notes: In the Twilight 2000 timeline, the LOHR 120mm SP Mortar System was often found in French airborne units, and extensively utilized by Foreign Legion units.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$76,997	D, A	580 kg	6.3 tons	6	5	Headlights	Open
Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor	
258/73	85/24	130	37	Std	W(2)	HF1 HS1 HR1	
Fire Control	Stabilization	Armament			Ammunition		
None	None	120mm TDA MO-120-RT-61 mortar, AAT-F1 or MAG			40x120mm, 2000x7.62mm		

TPK VBL Mortar Carrier

Notes: This is an open-topped version of the TPK 4.20 VBL APC with drop sides and rear, allowing the mounting of an 81mm mortar and ammunition racks in the rear. However, the VBL Mortar Carrier does not have a roof over the rear area; only the cab has overhead armor. The mortar can be one of a number of standard 81mm mortars; the mortar is locked down in its standard configuration with clamps mounted on the floor of the carrier. The mortar fires over the rear of the vehicle; it has very limited traverse, however, other than that provided by manipulating mortar controls. The cab has the driver on the right side; on the left is the commander, who has an overhead hatch with a weapon mount. Like the VBL APC, the cab has a large two-piece bullet-resistant windshield to the front, with armored shutters that can be lowered over the windshield. The shutters have vision slits in them. The cab also has a small bullet-resistant on each side in the door, and a sliding panel can be slid over these windows. The rear area has no windows, vision blocks, or firing ports; defenders simply fire over the open top.

The VBL Mortar Carrier has a 4x4 suspension with run-flat tires; puncture-resistant tires are optional. The standard transmission is manual, though an automatic transmission can be provided at buyer request. The engine is a Perkins diesel engine developing 135 horsepower engine.

Twilight 2000 Notes: Though at the beginning of the 1990s, only the Central African Republic, Gabon, and the Ivory Coast had any VBL Mortar Carriers, the French manufactured a batch of about 50 and supplied them to their Army, and especially, to the Foreign Legion.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$54,513	D, A	700 kg	7.8 tons	5	7	Headlights	Enclosed
Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor	
143/72	74/36	360	46	Std	W(3)	HF5 HS3 HR3	
Fire Control		Stabilization		Armament		Ammunition	
None		None		81mm mortar, AAT-F1 (C)		40x81mm, 800x7.62mm	

VAB PM 120R 2M

Notes: Before we begin, I should note that the designation I have given this vehicle is probably not the right one. It is based on the designations of other vehicles in similar roles, and I have not been able to discover the actual designation of this mortar carrier. This mortar carrier consists of a VAB VTT APC which has been modified to carry the TDA 120R 2M recoiling rifled 120mm mortar, but the recoil-dampening system of the mortar allows it to be carried by much lighter vehicles and reduces considerably the wear on the vehicle's shock absorbers. This VAB-based version of this 120R 2M mortar carrier began testing by the French Army in 2003, and has since gone into production and service; the mortar itself has since gone onto ground- and trailer-mounted versions and mounting into a variety of vehicles, which have been marketed since 1994 or have actually sold on the international market. Readers can see the stats on the TDA 120R 2M in the appropriate section, French Mortars (though I'll admit it is not there yet, and will be a future addition to these pages. I'm quite remiss in the area of large-caliber guns and mortars.)

To make a long story short, the mortar can be rotated through 110-degrees on either side of facing to the rear and fired in that direction, another thing that the 120R 2M's shock-absorbing system allows. Instead of the manual manipulation that must rear-mounted mortars require, elevation, traverse, and leveling of the mortar (to an extent) are handled hydraulically by the 120R 2M's system through the use by the gunner of a joystick and small LCD screen (about the size of a modern iPhone) and an integrated mortar fire control computer. The same system allows the mortar to be lowered enough for the VAB PM 120R 2M to close its roof hatches, making the VAB PM 120R 2M look pretty much like any other VAB VTT (though seemingly lightly armed). Most countries opt for their 120R 2M mortars to be equipped with an automatic loading system, as do the French; the 120R 2M is still breech-loaded, but the rounds are but on a sort of elevating system which raises the round quickly to the proper height, then drops it down the tube. Therefore, even firing the mortar can be done from inside the armor envelope, with only the top hatches being open. The VAB PM 120R 2M does not require an auxiliary ground-mount baseplate, bipod, or anything like that; the 120R 2M in this mode cannot be dismounted and turned into a ground-mounted version without a great deal of depot-level work. The mortar has its own baseplate inside the vehicle and does not require a bipod; it does have a sensor head with day and night cameras to allow the gunner to control the mortar fire while inside the armor envelope of the VAB.

Of course, the base chassis is that of the VAB VTT basic wheeled APC. (This will be a tip-off to some, even when the mortar is retracted and the hatches are closed, because few countries of units use the base VAB VTT chassis, preferring one of the VAB's many variants.) The driver is on the front left of the vehicle, with the commander to his right; both have overhead hatches, and there is also a door on the hull side for each of them. The driver and commander have bullet resistant windshields to their front and bullet-resistant windows to their sides; these may be further protected by closing armored shutters, with the front shutters having vision slits in them. The commander has an enlarged hatchway with a ring mount above his station, and the ring mount can take any one of several light, medium, or heavy weapons ranging from Minimi-type weapons to automatic grenade launchers. The weapon station to the rear of the driver and gunner that are normally present on the VAB VTT is deleted. The front two armored shutters on either side of the former passenger area are retained, but the rest are welded shut. The two rear doors are retained, largely for the loading of ammunition and/or equipment (though space is tight for that sort of thing), and also allowing for the entry and exit of crewmembers. The crew has the benefit of a collective NBC system, as well as fire detection and suppression systems for the engine, rear area, and fuel tanks. Radios include a data-capable long-range radio, a further long-range radio, and a data-capable medium-range radio. The vehicle is equipped with GPS and a mapping system, accessible by the commander and driver via small LCD screens; it is capable of self-plotted fire (based on map grids; it does not have access to satellite information other than position and it does not have a laser rangefinder). The VAB PM 120R 2M does carry a hand-held laser designator, though of course this would primarily be useful in the case of self-observed fire, and the vehicle's designator can only guide smart 120mm mortar shells. On the upper side front on each side are three smoke grenade launchers.

The use of a VAB VTT base chassis gives the VAB PM 120R 2M basic, but not exceptional armor. However, armor is somewhat improved in the rear section by the installation of both solid Kevlar panels and Kevlar anti-spalling blankets, which are meant primarily to protect the ammunition, with additional crew protection being an incidental. Armor is of all-welded steel and is moderately-sloped on the front and sides. The VAB PM 120R 2M has an automatic fire detection and suppression system for the troop compartment, driver/commander compartment, engine compartment, and fuel tanks. The VAB PM 120R 2M is fully amphibious, requiring the erection of a trim vane at the front and switching on bilge pumps, requiring two minutes. Propulsion in the water is via waterjets at the rear with deflection vanes for steering. The driver controls these vanes by a joystick. The waterjets are not powerful, but better than propulsion by motion of the wheels. Other driver controls are conventional, and transmission is manual. The VAB PM 120R 2M uses the 6x6 configuration, which is switchable to 6x4 for road use. The suspension is cross-country and uses large run-flat tires. As with some other French VABs, the VAB PM 120R 2M is powered by

a Renault MIDR 06-20-45 450-horsepower turbocharged diesel, chosen because the mortar system and the ammunition and other equipment carries already make the vehicle much heavier than the standard VAB VTT.

Twilight 2000: The French Army had six of these vehicles at the start of the Twilight War, with 6 more being produced during the war. This compares with 36 Piranha-based 120R 2M mortar carriers, with 10 more being acquired during the War, and 72-trailer-mounted TDS 120M 2R mortars. The VAB-based mortar carriers were retained in France, and four of them survived the War.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$37,176	D, A	395 kg	17.8 tons	2 (+3)	3	Passive IR (D)	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
120/67	27/16/2	300	176	Std	W(4)	HF6 HS5 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	120mm TDA 120R 2M Mortar; Mk 19 or HK GMG or M-2HB or AAT-F1 or MAG or Minimi (or other such types)	50x120mm; 380x40mm or 1200x.50 or 2000x7.62mm or 2740x5.56mm

VPX 40 M 120

Notes: This is an interesting little vehicle; it is in fact one of those vehicles that stretches the definition of the word "vehicle." Essentially, the VPX 40 M 120 is little more than a light platform on treads, with a 120mm mortar on a special mount at the rear of the vehicle. The VPX 40 120 M is designed to provide mobile heavy mobile fire support to airborne, heliborne, and light infantry. The VPX 40 M 120 has a rudimentary driver's position at the front left, and another seat is in the front right; the rest of the crew sit on two small seats in the rear of the vehicle (very small seats). In between the two front seats and the rear section is an ammunition storage area. The VPX 40 M 120 is armored, but the armor protection extends only as far up as the sides of the vehicle, which provides only a little over a meter of protection for those in the rear and a bit more for those in the front seats (their head and shoulders are above the armor envelope). The armor is also rather thin, though it is all-welded armor plate. There is no overhead protection, not even a provision for bows, and the rear of the vehicle is also open. No mounts for weapons other than the mortar are provided.

The turbocharged 125-horsepower diesel engine is mounted at the rear right of the vehicle, with the fuel tank on the left. The engine power is quite good compared to the low weight of the VPX 40 M 120, giving the little machine surprising agility. The transmission is automatic. Firing the mortar takes a fair amount of preparation; the mortar must be unlocked and lowered, and when unlocked it rests on a heavy A-shaped strut extending from the rear of the vehicle and another which connects to the mortar barrel. The suspension of the vehicle is also lowered at the rear, almost to the ground, where it rests on the baseplate, which is built into the floor of the vehicle and extended through the floor of the vehicle so that it is in contact with the ground when the suspension is lowered. Preparing for a move consists of the reverse of those steps. Traverse is limited to what the mortar controls can mechanically provide. A mortar fire control computer is provided with the vehicle.

Twilight 2000 Notes: This vehicle was primarily in use by French Foreign Legion and airborne forces, and then only in small numbers.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$77,109	D, A	150 kg	4.5 tons	4	3	Headlights	Open

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
158/111	35/25	75	34	Std	T2	HF3 HS2 HR0

Fire Control	Stabilization	Armament	Ammunition
None	None	120mm MO-120-RT-61 mortar	20x120mm

Wiesel 2 with 120mm Mortar

Notes: This is a Wiesel 2 with an externally mounted 120mm mortar, and with a special soft recoil system designed for use with the light Wiesel chassis. In addition, two stabilizers must be lowered to the ground before firing. These vehicles were very useful in adding heavy bombardment capability to Airborne, Airmobile, and Light Divisions.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$69,280	D, A	300 kg	4.62 tons	3	4	Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
158/111	35/25/3	80	40	Std	T3	HF4 HS2 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	120mm mortar	20x120mm

Wiesel BTM-263 Mortar Vehicle

Notes: This Wiesel 1 is fitted with a turret housing a 60mm gun/mortar and MAG machinegun. It is otherwise the same as the Wiesel 1 BTM-208. It was designed to provide rapid, mobile fire support to Airborne, Airmobile, and Light Divisions.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$44,990	G, A	300 kg	2.86 tons	3	3	Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
237/166	50/35	80	40	Trtd	T3	TF2 TS2 TR2 HF4 HS2 HR2

Fire Control	Stabilization	Armament	Ammunition
+2	Fair	60mm gun/mortar, MG-3	24x60mm, 200x7.62mm

2B9M/MT-LB Mortar Carrier

Notes: This Hungarian vehicle is based upon the MT-LB, and is fitted with drop rear sides and a Vasilyek automatic mortar in the rear. The MT-LB chassis has a more powerful and fuel-efficient engine and larger fuel tanks. The 2B9M also has a laser rangefinder (for direct fire), and equipment that measures meteorological data, vehicle attitude, target distance, and target coordinates. A computer that allows fire within 2 minutes after a stop coordinates this. It is not known whether this vehicle was designed for export or for the Hungarian Army.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$117,621	D, A	500 kg	13 tons	3	6	Headlights	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
107/75	25/15/2	550	57	Std	T3	HF4 HS2 HR2

Fire Control	Stabilization	Armament	Ammunition
+2	None	82mm Vasilyek automortar	128x82mm

2B9M/BMP-1 Mortar Carrier

Notes: This is another Hungarian Vasilyek carrier, this time based upon the chassis of the BMP-1. The turret has been removed, and a raised superstructure has been added that runs from the rear to the middle of the vehicle. Inside the rear of the vehicle is the Vasilyek, which fires forward. This mortar carrier also has the same fire-control equipment and computers that the 2B9M/MT-LB has.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$116,736	D, G, AvG, A	400kg	13 tons	3	7	Active/Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
150/105	30/20/3	460	111	Std	T2	HF8 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
+2	None	82mm Vasilyek automortar	192x82mm

Sarath Mortar Carrier

Notes: This is the hull of the BMP-2 (which in India is called the Sarath), with the turret removed and the rear area modified to carry an 81mm mortar. The area where the turret was is covered with large double hatches through which the mortar fires, and the rear deck has a cargo stand on which extra ammunition, crew equipment, or mortar equipment can be carried.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$110,443	D, G, AvG, A	750 kg	13 tons	4	7	Passive IR, Image Intensification	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
155/109	35/25/3	462	110	Std	T2	HF8 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	81mm IOF E-1 mortar, MAG (C)	108x81mm, 2000x7.62mm

ASCOD Mortar Carrier

Notes: This is an ASCOD IFV chassis fitted with a turret mounting a 120mm breech-loading mortar. There is a mount by the commander's hatch for a weapon. The vehicle is equipped with a fire control computer and GPS to allow the vehicle to fire accurately at targets within 3 phases of a halt as long as the target's location is known. As of 2003, this vehicle was being aggressively marketed to countries who had bought the ASCOD APC, but none had been sold as of yet.

Twilight 2000 Notes: A rare vehicle, the ASCOD Mortar Carrier was considered a delight to its crews, as it is easy to maintain and allows the crew to fire from under armor protection, as well as conduct some limited direct fire and self-defense against armored targets and light vehicles.

Merc 2000 Notes: This vehicle was generally passed on, even by countries using the other vehicles in the ASCOD range; conventional mortar vehicles were simply cheaper.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$210,895	D, A	500 kg	25 tons	4	9	Thermal Imaging, Image Intensification	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
128/90	25/20	860	213	Trtd	T3	TF14 TS7 TR6 HF18 HS5 HR4

Fire Control	Stabilization	Armament	Ammunition
+2	Fair	120mm gun/mortar, MG-3, MG-3 (C)	78x120mm, 2900x7.62mm

RN-94 Mortar Carrier

Notes: This is an RN-94 armored personnel carrier modified for the Turkish Army to carry an 81mm mortar. The mortar is usually a long-barreled long-range model (normally the TDA MO 81 LP, though others can be fitted), and fires through the rear deck, which is fitted with long hatches to allow this. There is no turret, but the commander's hatch has a machinegun mount.

Twilight 2000 Notes: This vehicle does not exist.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$76,612	D, A	900 kg	10.93 tons	5	4	Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
173/104	40/25/5	325	88	Std	W(4)	HF6 HS4 HR3

Fire Control	Stabilization	Armament	Ammunition
None	None	81mm TDA MO 81 LP mortar, M-2HB (C)	90x81mm, 1700x.50

T-55/160mm

Notes: This Iraqi modification of the T-55 tank is the T-55 chassis with a large circular superstructure that protects an M-160 160mm mortar. The superstructure is not a turret and does not rotate, but does have a limited traverse of 25 degrees from the center. Access doors are in the sides and rear of the superstructure.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$122,731	D, A	400 kg	32.46 tons	5	12	Active/Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
121/85	25/20	812+380	215	Trtd	T6	TF6 TS6 TR6 HF67 HS16 HR8

Fire Control	Stabilization	Armament	Ammunition
None	None	M-160 160mm Mortar, PKT (C)	50x160mm, 3000x7.62mm

M-7/160mm

Notes: This modification of the M-7 Priest artillery carrier is found in service in the Israeli Army. It carries a Soltam 160mm breech-loading mortar mounted in the center of the vehicle, and the gasoline engine has been replaced with a diesel engine. The "pulpit" mounted machinegun has been removed, and two side machineguns are mounted instead.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$111,100	D, A	500 kg	36.65 tons	8	11	Headlights	Open

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
90/63	20/15	700	166	Stnd	T5	HF27 HS8 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	160mm mortar, 2xMAG or 2xM-2HB	56x160mm, 2000x7.62mm or 1000x.50

SV-60

Notes: This is an 81mm mortar carrier based on the Japanese SU-60 armored personnel carrier. In this vehicle, the rear passenger area is taken up by ammunition racks and a turntable-mounted 81mm mortar. The glacis plate carries a bipod and baseplate for firing the mortar away from the vehicle. Only 18 of these vehicles were built. Ammunition racks for ready ammunition are few.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$63,469	D, A	950 kg	12.1 tons	5	4	Headlights	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
120/84	25/20	370	82	Std	T2	HF6 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	81mm mortar, M-2HB (C), MAG (Bow)	24x81mm, 435x.50, 2200x7.62mm

SX-60

Notes: This is also a mortar carrier variant of the SU-60, this time mounting a 4.2" mortar. The bipod, bridge, and baseplate take up so much room on the glacis plate that the bow machinegun has been removed. Again, internal racks for ready ammunition are few and the vehicle often finds itself loaded with crates of ammunition. Only 18 of these vehicles were produced.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$64,920	D, A	550 kg	12.9 tons	5	5	Headlights	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
114/80	25/15	370	82	Std	T2	HF6 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	4.2" mortar, M-2HB (C)	8x4.2", 1700x.50

Armored Mortar System (AMS)/M-113

Notes: This is the same turret as on the Saudi AMS/LAV-25, mounted on an M-113 chassis. Only Kuwait uses this vehicle.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$163,590	D, A	1 ton	12.2 tons	3	6	Passive IR, Thermal Imaging	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
113/79	25/15	360	77	Trtd	T2	TF8 TS5 TR5 HF6 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
+2	Fair	120mm gun/mortar, MAG (C)	55x120mm, 1000x7.62mm

Chaimite V-600 Mortar Carrier

Notes: The basic form of this vehicle is a Chaimite V-200 with an 81mm or 82mm mortar fitted in the passenger compartment, firing to the rear. The 81mm mortar is fitted to most of these vehicles; the 82mm mortar equips the V-600s used by Libya.

The version with a 120mm mortar is the same as the V-600 81/82mm, except that the chassis is a longer 6x6 version, and the mortar carried is a 120mm TDA or Bloc mortar. The 120mm Bloc mortar version is used by Libya; the 120mm TDA mortar version is used by the other countries using the V-600 120mm.

The variant of the V-600 with a 160mm mortar was built only for Libya, who uses them with its M-1953 mortars. It is further enlarged over the V-600 120mm, being an 8x8 chassis to cope with the huge mortar, along with a more powerful engine.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
81/82mm	\$59,243	D, A	600 kg	6.1 tons	4	3	Passive IR	Enclosed
120mm	\$70,855	D, A	700 kg	6.9 tons	4	3	Passive IR	Enclosed
160mm	\$83,096	D, A	800 kg	8.4 tons	6	3	Passive IR	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
81/82mm	282/169	54/33/6	300	77	Std	W(3)	HF3 HS2 HR2
120mm	252/151	50/30/5	350	77	Std	W(4)	HF3 HS2 HR2
160mm	211/127	44/26/4	450	77	Std	W(6)	HF3 HS2 HR2

Vehicle	Fire Control	Stabilization	Armament	Ammunition
81/82mm	None	None	MAG (C) or M-2HB (C) or M-249 (C); 81mm or 82mm mortar	2400x7.62mm or 1700x.50 or 3200x5.56mm; 50x81mm or 82mm
120mm	None	None	MAG (C) or M-2HB (C) or M-249 (C); 120mm TDA or Bloc mortar	2800x7.62mm or 2000x.50 or 3700x5.56mm; 40x120mm
160mm	None	None	MAG (C) or M-2HB (C) or M-249 (C); 160mm mortar	3200x7.62mm or 2300x.50 or 4200x5.56mm; 35x160mm

MLVM AR

Notes: This Romanian vehicle is an MLVM Mountaineers Combat Vehicle with a turntable mounting a 120mm mortar in the rear instead of troop seats. The vehicle also carries a baseplate and bipod for firing the mortar away from the vehicle. The roof of the MLVM is slightly raised to allow the rear deck hatches to be closed over the mortar barrel.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$80,753	D, A	400 kg	9 tons	5	4	Active/Passive IR	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
137/96	30/20/3	480	56	Std	T2	HF7 HS3 HR3

Fire Control	Stabilization	Armament	Ammunition
None	None	120mm Mortar, PKT (C)	56x120mm, 2500x7.62mm

TAB-71AR

Notes: This is a mortar carrier version of the standard TAB-71 armored personnel carrier. The turret is removed, and the roof is fitted with large hatches to permit operation of an 82mm mortar. There is a machinegun mount to the rear of the mortar position.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$84,093	G, A	350 kg	11 tons	4	4	Active IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
215/129	45/25/5	290	103	CiH	W(4)	HF2 HS2 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	82mm mortar, PK (C)	110x82mm, 2000x7.62mm

TAB-79AR

Notes: This is a mortar carrier based upon the TAB-79 reconnaissance armored personnel carrier. The turret is removed, and a large hatch is installed behind the driver and commander's position to permit operation of an 82mm mortar. To the rear of this hatch is a mount for a PK machinegun.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$69,501	D, A	250 kg	9.06 tons	4	4	Active IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
156/94	35/20/3	200	56	Std	W(3)	HF3 HS3 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	82mm mortar, PK (C)	110x82mm, 2000x7.62mm

Fire Control	Stabilization	Armament	Ammunition
None	None	82mm mortar, PK (Rear)	78x82mm, 2000x7.62mm

2S9 (SO-120) Anona

Notes: This vehicle is intended for fire support of infantry units, particularly Airborne and Naval Infantry units. It is essentially a BTR-D airborne combat vehicle topped with a large turret mounting a 120mm breech-loading mortar. The traverse of the turret is limited to 35 degrees left or right of center and the mortar may be fired in direct fire or indirect fire modes. The driver is in the front center of the vehicle with the commander to his left. The turret has a hatch for the gunner; this hatch sometimes has a weapon mount, but this is a rare modification. A modified form of the turret on the 2S9 is mounted on the BTR-80-based 2S23 mortar vehicle. As this vehicle was first produced in the early 1980s, there was time for sales to other countries, such as Afghanistan and Vietnam, but it was not widely sold.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$80,336	D, A	750 kg	8.7 tons	3	6	Passive IR, Image Intensification	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
196/137	40/30/4	400	88	Trtd	T4	HF8 HS4 HR4 TF4 TS4 TS4

Fire Control	Stabilization	Armament	Ammunition
+1	Basic	120mm gun/mortar	25x120mm

2S23 NONA-SVK

Notes: This is a version of the BTR-80. The turret has been replaced with a turret mounting a 120mm breech-loading gun-mortar. There is a PKT (C) on the turret roof for anti-aircraft work. The firing ports have been deleted.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$134,102	D, A	2.5 tons	14.5 tons	4	5	Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
143/86	33/20/3	290	78	Trtd	W(4)	TF4 TS4 TR4 HF5 HS3 HR3

Fire Control	Stabilization	Armament	Ammunition
None	None	120mm gun/mortar, PKT (C)	30x120mm, 1000x7.62mm

2S31 Vena

Notes: This is a 120mm mortar/howitzer vehicle based on the BMP-3 chassis. It fires mortar ammunition of either Bloc or NATO-compatible types. The standard turret is removed and replaced with a much larger one mounting the mortar/howitzer. The vehicle has an automatic survey and orientation system, and the vehicle can fire accurately without input from an FDC if the target location is known, within 7 minutes of a halt. The vehicle is equipped with all the sensors of the BMP-3 and also has a laser detection system that automatically launches smoke grenades in the direction of the enemy laser. The gun fires new ammunition as well as the ammunition of the 2S9 and 2S23 and ammunition of Western make. The vehicle also has the singular luxury in a combat zone of a chemical toilet inside the vehicle. The commander's machinegun may be aimed and fired from under armor. The roof hatches have been removed, and the rear hatches are replaced with a single downward-opening hatch on the left rear. There is also a hatch in the rear of the turret for ammunition loading. There is a commander's hatch in the turret.

Twilight 2000 Notes: This vehicle does not exist.

Merc 2000 Notes: This vehicle did not fare well in the budget-conscious Merc 2000 Russia.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$201,538	D, G, AvG, A	800 kg	19 tons	4	12	Passive IR, Image Intensification	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
115/80	23/16/2	462	157	Trtd	T3	TF11 TS4 TR4 HF8 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
+2	Fair	120mm Mortar/Howitzer, PKT (C)	80x120mm, 1000x7.62mm

MT-LB Mortar Carrier

Notes: This is a rather common mortar vehicle in Pact and Russian service, though in Russian service it is primarily found in Category 3 and Mobilization-Only units. It is an MT-LB armored personnel carrier with an 82mm or 120mm Pact mortar mounted in the passenger area (the exact type depends on the country of service). In the 82mm mortar carrier, the rear deck has a two-part circular hatch for the mortar to fire out of, while in the 120mm version, the hatch is two part, long, and rectangular. In both cases, bipods and baseplates are carried so that the mortar may be fired away from the vehicle. The vehicles retain their cupola-mounted machineguns. The large MT-LB chassis can carry a lot of ammunition for the mortars.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
82mm	\$84,564	D, A	1 ton	12 tons	4	7	Headlights	Shielded
120mm	\$85,940	D, A	1 ton	12.4 tons	4	7	Headlights	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
(Both)	129/90	30/20/3	450	88	Std	T3	HF4 HS2 HR2

Vehicle	Fire Control	Stabilization	Armament	Ammunition
82mm	None	None	82mm Mortar, PKT	120x82mm, 2000x7.62mm
120mm	None	None	120mm Mortar, PKT	68x120mm, 2000x7.62mm

SM-240 (2S4) Tyul'pan

Notes: These heavy self-propelled mortars have been in service with the Russian Army since 1975, and later with Iraq and Lebanon. The chassis is a modified version of the chassis used for the SA-4 SAM. The driver is seated to the front left, the driver in front and commander behind him in a cupola with a machinegun. The two other crewmen are seated in the rear. (Five other crewmen are transported in another vehicle). The 2B8 mortar is carried over the deck of the vehicle when traveling and is lowered to the rear before firing. The mortar is breech-loaded from two 20-round magazines by an automatic loader. The SM-240 is normally an asset at regimental and higher levels. The SM-240 is perhaps the only mortar in existence capable of firing tactical nuclear ammunition.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$412,328	D, A	500 kg	46.5 tons	4 (+5)	18	Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
122/86	25/20	850	249	Std	T6	HF6 HS3 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	240mm mortar, PK (C)	40x240mm, 1500x7.62mm

Al-Fahd AF-40-8-1 Mortar Carrier

Notes: This is a variant of the basic Al-Fahd APC, carrying a 120mm mortar and accessories and crew. This version of the Al-Fahd has a turret carrying a breech-loaded mortar, and does not carry passengers.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$107,719	D, A	500 kg	13.1 tons	5	5	Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
256/154	50/30/5	550	165	Trtd	W(6)	TF10Sp TS6Sp TR4 HF12Sp HS5Sp HR3

Fire Control	Stabilization	Armament	Ammunition
+2	Fair	120mm Mortar, MAG, MAG (C)	60x120mm, 2150x7.62mm

Armored Mortar System (AMS)/LAV

Notes: This is a 120mm breech-loading mortar mounted in a turret on a LAV-25 chassis. Four smoke grenade launchers are mounted on either side of the turret, and a commander's machinegun located by a turret hatch. The fire-control system incorporates a GPS system, and vehicle attitude sensors, as well as a laser rangefinder. This vehicle is used only by Saudi Arabia.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$94,130	D, A	1 ton	13.1 tons	3	4	Passive IR	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
176/106	38/22/4	300	94	Trtd	W(6)	TF8 TS5 TR5 HF6 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
+2	Fair	120mm gun/mortar, MAG (C)	50x120mm, 1620x7.62mm

Casspir Mortar Carrier

Notes: As it sounds, this is a version of the Casspir APC carrying an 81mm mortar and its crew and ammunition. The Casspir Mortar Carrier has the same level of mine protection as the APC version. This vehicle has no overhead protection for the fighting compartment.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$97,953	D, A	750 kg	11.04 tons	5	4	Headlights	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
145/87	33/20	220	62	Std	W(3)	HF3 HS2 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	81mm mortar, SS-77 (C)	192x81mm, 1000x7.62mm

Ratel Mortar Carrier

Notes: The Ratel mortar carrier has its turret removed, and instead has a cupola to the rear of the driver which has a machinegun mount. The mortar is on a turntable which may be rotated a full 360 degrees, and fires through a two part hatch. This mortar carrier version has only two firing ports. The mortar carrier has its own fire-direction computer with a GPS system that allows the vehicle to "shoot-and-scoot." The first projectile can be fired within 10 seconds of a halt.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
81mm	\$119,077	D, A	300 kg	16.6 tons	4	6	Passive IR	Enclosed
120mm	\$127,914	D, A	300 kg	16.8 tons	6	6	Passive IR	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
81mm	113/68	30/17	430	79	Std	W(6)	HF11 HS6 HR4
120mm	113/68	30/17	430	79	Std	W(6)	HF11 HS6 HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
81mm	None	None	81mm mortar, MAG (C)	150x81mm, 2000x7.62mm
120mm	None	None	120mm Mortar, MAG (C)	46x120mm, 2000x7.62mm

KIFV Mortar Carrier

Notes: The K-242A1 is a carrier for a heavy mortar based on the KIFV chassis. In this version, the passenger compartment is taken up by ammunition and an M-30 4.2" mortar, and the turret is deleted. There is a large, three-part hatch over the mortar compartment, similar to that on the US M-106A2. The firing ports are retained, and the vehicle has a machinegun mount for local and antiaircraft protection. A bipod, bridge, and baseplate are carried to allow the mortar to be deployed away from the vehicle.

The K-281A1 is a variant of the KIFV, carrying an 81mm mortar in the back along with ammunition. A bipod and baseplate is carried to allow the mortar to be operated away from the vehicle. The turret is deleted, but the firing ports are retained. There is a large, three-part hatch over the rear compartment to allow the mortar to be fired. This vehicle is similar to the K-242A1, but uses an 81mm mortar, and is rather less common than that vehicle.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
K-242A1	\$99,233	D, A	1 ton	12.4 tons	4	5	Passive IR	Shielded
K-281A1	\$93,322	D, A	1 ton	12.4 tons	4	5	Passive IR	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
(Both)	163/114	35/25/3	400	104	Trtd	T3	HF11 HS7Sp HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
K-242A1	None	None	M-30 4.2" mortar, M-2HB (C)	88x4.2", 1000x.50
K-281A1	None	None	81mm Mortar, M-2HB (C)	114x81mm, 1000x.50

BMR-3560/53E

Notes: The BMR-3560/53E is a variant of the Spanish BMR-600 armored personnel carrier. This version carries an 81mm mortar on a turntable in the passenger compartment, firing through two large hatches in the roof. The vehicle carries a bipod and baseplate to allow the mortar to be fired away from the vehicle if necessary. The BMR-3560/53E does not carry passengers, the rear area being taken up by the mortar, associated equipment, and ammunition. The machinegun cupola is retained.

The BMR-3560/59E is the same vehicle as above, but carrying a 120mm mortar instead of an 81mm mortar.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
BMR-3560/53E	\$62,159	D, A	500 kg	15.25 tons	5	5	Passive IR	Enclosed
BMR-3560/59E	\$78,201	D, A	500 kg	15.4 tons	5	5	Passive IR	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
(Both)	193/116	40/25/4	400	114	Std	W(4)	HF8 HS4 HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
BMR-3560/53E	None	None	81mm Mortar, MG-3 (C) or M-2HB (C)	107x81mm, 1800x7.62mm or 1100x.50
BMR-3560/59E	None	None	120mm Mortar, MG-3 (C) or M-2HB (C)	72x120mm, 1800x7.62mm or 1100x.50

CV-90 AMOS

Notes: This Swedish vehicle is a version of the CV-9040 IFV. It is known to the Swedish as the Grkbv. Instead of the normal turret, its turret mounts a twin 120mm automatic mortar system capable of firing at the rate of 2 rounds per combat phase. The AMOS is equipped with a fire-control computer, GPS, plotting board, map board, and other equipment to allow it to be laid and fired quickly. The mortars have a barrel length of 2.4 meters.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$321,854	D, A	1 ton	26 tons	4	11	Passive IR, Thermal Imaging, Image Intensification	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
131/92	30/20	525	179	Trtd	T4	TF7 TS4 TR4 HF18 HS7 HR4

Fire Control	Stabilization	Armament	Ammunition
+3	None	Twin 120mm AMOS Mortars, MAG	66x120mm Mortar Shells, 3000x7.62mm

120R 2M/TIFV

Notes: The 120R 20M in the designation refers to the mortar, a new French rifled 120mm mortar that uses a system of shock absorbers that takes up a lot of the recoil of the mortar. This mortar system weighs 1.4 tons and is a version of the TDA MO-120-RT. This system can be installed in any wheeled or tracked vehicle with sufficient space in its cargo area that weighs at least 10 tons (including the weight of the mortar). The weight of the system includes a semi-automatic loading system with a magazine of 40 rounds, and allows a rate of fire of 1 per phase.

Twilight 2000 Notes: This particular system is the one sold to Turkey before and during the Twilight War, and uses Turkish Infantry Fighting Vehicle (TIFV) chassis. This vehicle was the bane of Greek, Iraqi, and Russian infantry formations, able to provide a large amount of fire support in a short amount of time. The vehicle includes GPS and a mortar firing computer that allows the mortar to accurately fire at targets without an FDC if the target location is known. The turret of the TIFV is removed and large hatches added to the rear deck to allow the mortar to fire.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$146,473	D, A	400 kg	12.95 tons	5	7	Active/Passive IR	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
139/97	30/20/3	416	96	Std	T2	HF8Sp HS4Sp HR3Sp

Fire Control	Stabilization	Armament	Ammunition
None	None	120mm 120R 2M mortar, M-2HB (C)	40x120mm, 1000x.50BMG

Cobra Mortar Carrier

Notes: This variant of the Cobra armored personnel carrier has a turntable mounting an 81mm mortar. Hatch arrangement is different, with two large hatches running from the rear to middle deck, and a hatch over the commander's position with a weapon mount. The doors and firing ports remain the same.

Twilight 2000 Notes: This vehicle does not exist.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$55,332	D, A	400 kg	6.25 tons	5	3	Passive IR	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
260/156	51/31/5	145	70	Std	W(3)	HF4 HS2 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	81mm mortar, MAG (C)	42x81mm, 425x7.62mm

Dragoon AMC (Armored Mortar Carrier)

Notes: This is a version of the Dragoon basic APC, with the passenger compartment taken up by a turntable-mounted 81mm mortar and associated equipment and ammunition. The pintle-mounted machinegun is retained and a bipod and baseplate is carried to allow the mortar to be fired away from the vehicle. The sliding roof hatch is replaced with two larger hatches opening right and left.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$68,617	D, A	1 ton	9.2 tons	5	4	Passive IR	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
241/145	50/30/5	350	111	Std	W(4)	HF5 HS3 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	81mm mortar, M-2HB	60x81mm, 600x.50

LAV-150 Mortar Carrier

Notes: The LAV-150 Mortar Carrier is a very basic sort of mortar carrier; little space is available for more than the crew, ammunition, and mortar equipment. It is, however, very inexpensive.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$65,753	D, A	200 kg	8.2 tons	4	4	Passive IR	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
220/132	45/25/5	303	96	Std	W(3)	HF5 HS3 HR3

Fire Control	Stabilization	Armament	Ammunition
None	None	81mm mortar, MAG (C)	49x81mm, 4800x7.62mm

LAV-300 Mortar Carrier

Notes: This is similar to the LAV-150 mortar carrier above, but uses the larger LAV-300 chassis. Like the LAV-150 mortar carrier, it is very basic, but inexpensive for a mortar vehicle.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$67,182	D, A	400 kg	13.1 tons	4	4	Passive IR	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
167/100	35/20/4	435	101	Std	W(3)	HF8 HS5 HR4

Fire Control	Stabilization	Armament	Ammunition
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None	None	81mm or 82mm mortar, MAG (C)	59x81mm or 82mm, 4800x7.62mm
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M-113-Based Mortar Carriers

Notes: The M-106A2 was the US Army's primary heavy mortar vehicle until the adoption of the M-1064A3, and still equips many regular Army divisions and most Reserve and National Guard units. The M-106A2 is an M-113A1 or A2 with the rear passenger area heavily modified to carry an M-30 4.2" mortar and the associated equipment. On the hull on the left side is the large baseplate and bridge for use when the mortar is dismounted from the vehicle. Inside are racks for ammunition and charges. It is a fairly cramped interior, but the space is well-used.

The M-125A2 is an M-113A2 modified to carry an 81mm mortar, with turntable and associated equipment. Some of these vehicles could still be found in National Guard units.

The M-1064A3 is an M-113A3 modified to carry a 120mm Soltam mortar, and fitted with a new power pack. This is the new US Army standard heavy mortar vehicle, but has not replaced all the M-106A2s yet, especially in Reserve and National Guard formations.

Twilight 2000 Notes: Most M-125A2s had been modified to the M-1064A3 standard by the time of the Twilight War, but they still existed in decent numbers in National Guard formations.

Merc 2000 Notes: Most M-125A2s have been sold or given to Third World proxy states.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
M-106A2	\$79,670	D, A	300 kg	12.09 tons	5	6	Passive IR (Driver Only)	Shielded
M-125A2	\$70,325	D, A	400 kg	12.07 tons	5	6	Passive IR (Driver Only)	Shielded
M-1064A3	\$84,832	D, A	300 kg	12.1 tons	5	6	Passive IR (Driver Only)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
M-106A2	106/74	25/15/2	360	105	Std	T2	HF6 HS4 HR4
M-125A2	108/76	25/15/2	360	108	Std	T2	HF6 HS4 HR4
M-1064A3	104/73	20/15/2	360	104	Std	T2	HF6 HF4 HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
M-106A2	None	None	M-30 4.2" mortar, M-2HB (C)	88x4.2", 2000x.50
M-125A2	None	None	81mm Mortar, M-2HB (C)	114x81mm, 2000x.50
M-1064A3	None	None	120mm Mortar, M-2JB (C)	69x120mm, 2000x.50